AMIGA WORLD

July 1988
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An IDGC/I
Publication

Win an Amiga 2000! Treasure Hunt on p. 60



SPECIAL PRINTER REPORT

- 24-Pin Power: The New Dot Printers
- Affordable Lasers
- 15 Print Utilities

PLUS!
Modula-2 Compilers
BASIC Video Titling

07

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PHOTON
V I D E O
Cell Animator



PROFESSIONAL ANIMATION! —
Now take advantage of "pencil testing" your animation in the privacy of your own home studio! With Cel Animator you can preview scenes, polish your work and know it performs the way you envisioned.

UN-EQUALLED VERSATILITY—
Cel Animator provides versatility that's unavailable with film, or the expensive Lyon-Lamb type stop-motion video tape equipment. With Cel Animator, your drawings are stored on a computer disk so each frame can be called up repeatedly and manipulated within a sequence after being "shot" only once. This is achieved because computer disk storage is "random access," meaning; any information stored on the disk can be called up at random, in whatever order required, as often as necessary!

BREAK THE "SEQUENTIAL" DILEMMA —
Tape and film are "sequential" and require you to shoot a "cycle" over and over again until the required number of repetitions are completed, or re-expose a held drawing for many consecutive frames. Using Cel Animator, however, you may simply create each drawing once, and then create a list, identifying each frame by number, and the program will call up the stored frame from memory and replay it as often as it is called for, or in whatever order you specify, and you can add or delete drawings. Essentially, the program follows your "exposure sheet" for you!

You can also experiment with your timing by simply changing the display time between frames; if you shoot a "pose test" you can adjust your timing repeatedly without reshooting anything, then add your breakdowns, re-time your delays and check again. No need to add in-betweens until you've fine-tuned your pose test.

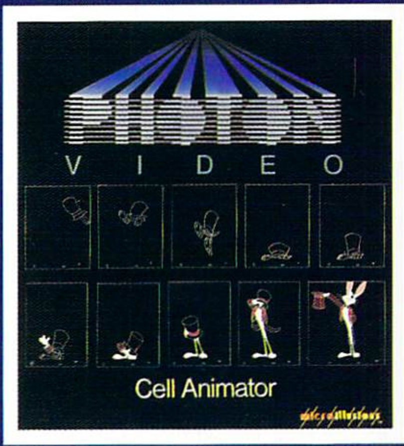
CONTINUOUS PLAY OPTION—
The program can also replay your sequence of frames in a continuous loop, so you can sit back and review the action repeatedly without having to rewind and play a video tape over and over again, or without ever having to wait for film to be shot, processed, and edited.

SOUND SYNCHRONIZATION—
Cel Animator allows you to digitize your pre-recorded sound track (dialogue, music or effects), and replay them frame by frame; or select any group of frames to replay, enabling you to locate and identify sounds according to frame number prior to doing your animation drawings. Then, review your pose test or completed animation synchronized with your digitized sound track, and you can then print an exposure sheet, vowels and consonants paired with frame numbers.

INTRODUCE COLOR! —
Finally, if you own one of the many paint programs available such as Photon Paint, you can paint your pencil drawings right on your computer, and use Cel Animator to replay them in full color, over any background you create. It is also possible to send your completed color scenes to video tape; thus producing a full color animated sequence right in your own home on your VCR or you can use Photon Video's Transport Controller software.

COMPATIBILITY —
Photon Video Products are fully compatible with most third party art, animation and rendering software systems.

TRANSPORT CONTROLLER —
This module allows you to take your animations frame by frame to video tape, by way of popular frame by frame controllers such as Lyon Lamb.™



OTHER PHOTON VIDEO PRODUCTS —
- EDIT 3D, Photon's powerful solid object Editor.
- RENDER 3D, Photon's amazing solid object rendering system.
- Photon Paint, this immense paint system gives you all you are accustomed to in a professional paint box, plus many advanced features like surface mapping and light source control!



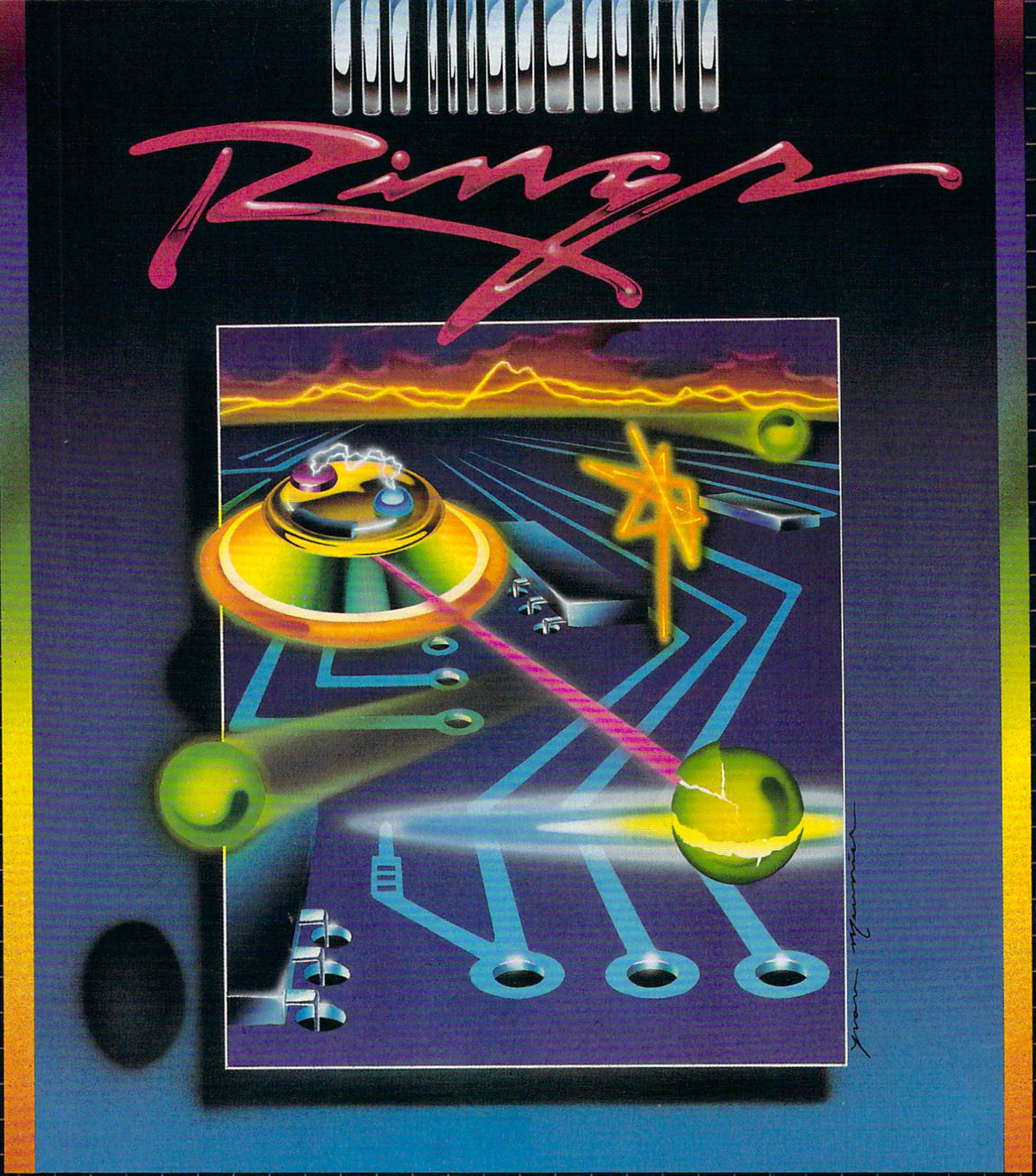


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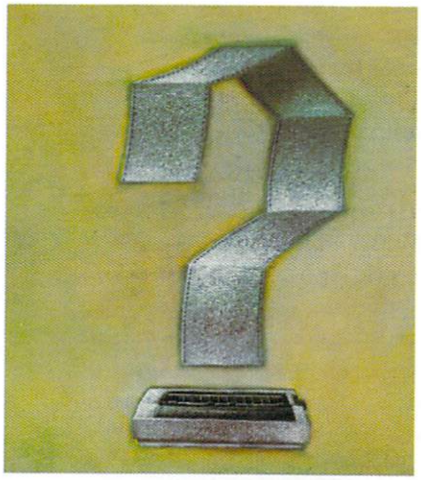
A Quarter Savers game.

TopDown DEVELOPMENT Inc.

Only from TopDown, only for the Amiga.

VOLUME 4, NUMBER 7 JULY 1988

CONTENTS



With prices of high-end printers starting to come down, individuals (and not just institutions and businesses) can now afford some of the better dot and laser printers. Two grand, however, is still a lot of money—that's why we're issuing this "Special Printer Report," evaluating and comparing a number of leading models in both categories, to help you make an informed choice if you're looking for a high-quality black-and-white printer.

And don't forget our CONTEST! AmigaWorld*'s Summer '88 Treasure Hunt starts this month, and the Grand Prize is an Amiga 2000 and a Getaway Weekend for 2 with luxury accommodations and airline tickets to and from the treasure site.*

FEATURES

ARTICLES

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DEPARTMENTS

WIN AN AMIGA 2000!
Plus a **Getaway Weekend for 2.** *AmigaWorld*'s three-part **Summer '88 Treasure Hunt** begins this month. Your first set of clues is waiting on **page 60**. Break out your maps and compasses: The game is on!

COVER ILLUSTRATION BY TIM TEEBKEN

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Ranks Among The Best

Professional Page can hold its head up in the company of such heavy hitters as Ventura Publisher and PageMaker.

Electronic Composition & Publishing March/April 1988

More reasons to own Professional Page

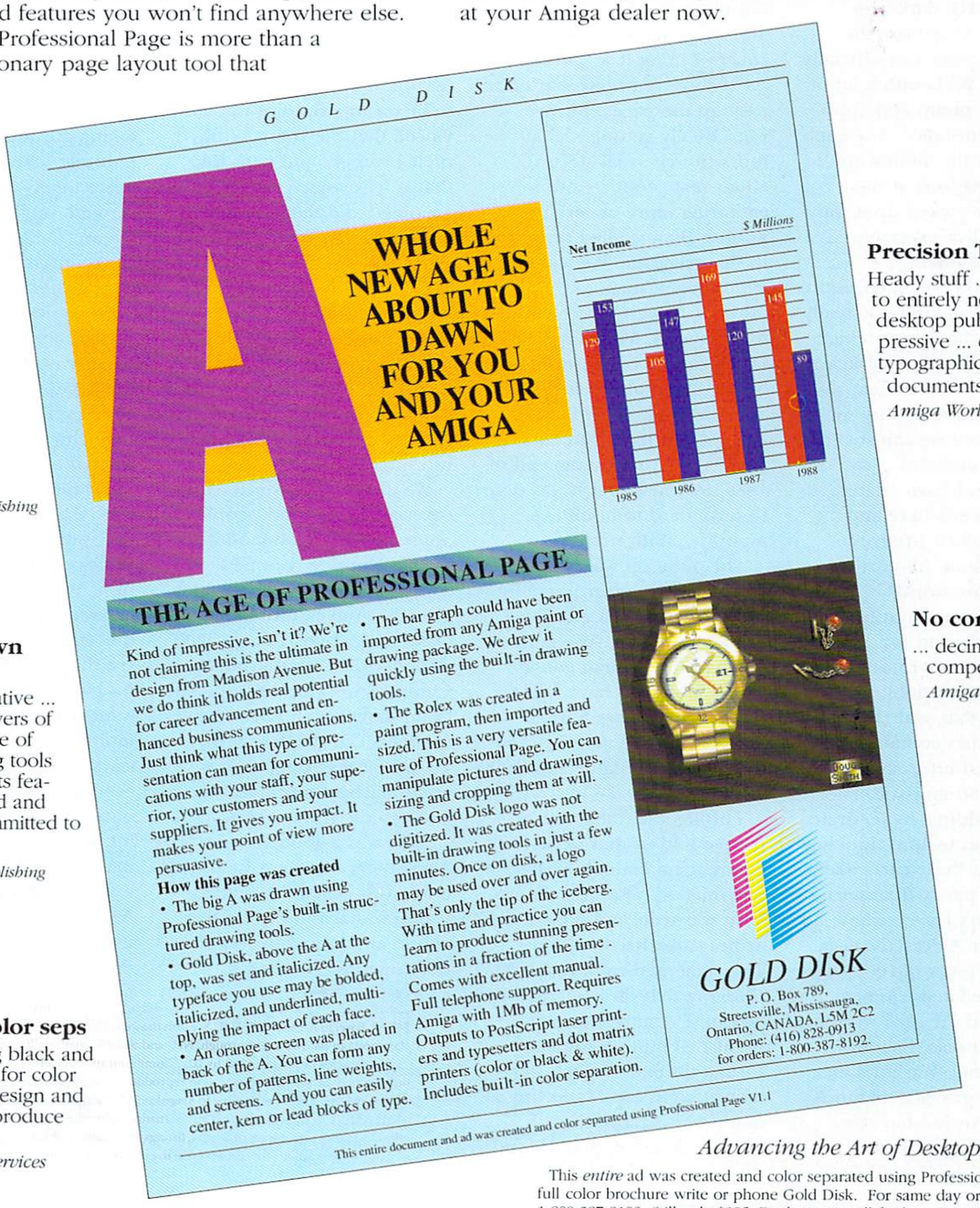
... compelling ... innovative ... deep access to the powers of PostScript ... good range of object oriented drawing tools ... the program is fast, its features are well integrated and Gold Disk appears committed to further refinement ...

Electronic Composition & Publishing March/April 1988

From concept to color seps

After years of preparing black and white camera-ready art for color printing, we can now design and compose in color and produce plate-ready final film.

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G O L D D I S K

A WHOLE NEW AGE IS ABOUT TO DAWN FOR YOU AND YOUR AMIGA

THE AGE OF PROFESSIONAL PAGE

Kind of impressive, isn't it? We're not claiming this is the ultimate in design from Madison Avenue. But we do think it holds real potential for career advancement and enhanced business communications. Just think what this type of presentation can mean for communications with your staff, your superior, your customers and your suppliers. It gives you impact. It makes your point of view more persuasive.

How this page was created

• The big A was drawn using Professional Page's built-in structured drawing tools.

• Gold Disk, above the A at the top, was set and italicized. Any typeface you use may be bolded, italicized, and underlined, multiplying the impact of each face.

• An orange screen was placed in back of the A. You can form any number of patterns, line weights, and screens. And you can easily center, kern or lead blocks of type.

• The bar graph could have been imported from any Amiga paint or drawing package. We drew it quickly using the built-in drawing tools.

• The Rolex was created in a paint program, then imported and sized. This is a very versatile feature of Professional Page. You can manipulate pictures and drawings, sizing and cropping them at will.

• The Gold Disk logo was not digitized. It was created with the built-in drawing tools in just a few minutes. Once on disk, a logo may be used over and over again.

That's only the tip of the iceberg. With time and practice you can learn to produce stunning presentations in a fraction of the time. Comes with excellent manual. Full telephone support. Requires Amiga with 1Mb of memory. Outputs to PostScript laser printers and typesetters and dot matrix printers (color or black & white). Includes built-in color separation.

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Amiga World, May 1988

No contest

... decimates its Amiga competition.

Amiga World, May 1988

Advancing the Art of Desktop Publishing

This *entire* ad was created and color separated using Professional Page. For a full color brochure write or phone Gold Disk. For same day order processing 1-800-387-8192. Still only $395. Dealers may sell for less. PageSetter owners call for our attractive upgrade offer.

ZEITGEIST

Birthday wishes for the Amiga and

AmigaWorld.

BACK IN THE dark ages, about three years ago, the Amiga computer was officially unveiled in NYC with a lot of hoopla and pomp and appropriate circumstance. As people walked into the auditorium to get their first look at the Amiga, they picked up a copy of a fairly slick magazine called *AmigaWorld*.

Exactly how we managed to have our premiere issue ready in time for the Amiga launch is a confused and convoluted story. If you want to hear all the gory details, stop by some afternoon and we can spend a few hours reminiscing over a beer or five. I have related parts of the tale here and there, and when I retire to write The Book About the Magazine, the world will know the whole story about how much trouble and fun it was.

That first issue came out in July '85, and we published one more issue that year. Those first two issues contained enough solid information to fill about half an issue. The rest was padding, hype, pretty pictures, and wishful thinking. I admit that those early issues were more pastry than meat, but we didn't have a whole lot to work with. At least the magazine looked great and got people interested in the Amiga.

We kicked off 1986 with one of our most talked about issues, the Andy Warhol issue. People still grimace or flinch or chuckle or kid me about that issue. Hey, I liked it. (I did the interview with Andy and wrote the story, so of course I think it was brilliant.) As 1986 wore on, we started to pick up the pace a bit. We were finally getting real authors to write real stories about real products. We were gathering more material to publish than we had room for in the magazine. We had gone from one extreme to the other. It was great to have all this material, but we quickly found ourselves constrained by the bi-monthly schedule. You wanted more information, and we had it, we just couldn't get it all to you. By the end of 1986, we knew that it was time to push hard to become a monthly publication.

The question was, were there enough advertisers out there to support a monthly Amiga magazine. (We had and still have more than enough readers, but as I have said before, as long as we have all those ads in the magazine, we won't have to charge you $8.00 a copy.)

Throughout 1985 and '86, people told us that we weren't giving them enough hard-core information about the Amiga. That was true, and other magazines capitalized on that. They emerged right and left, claiming that they were for the "serious" Amiga user; they published more technical information than we did, were more timely, etc. My feeling is that there is more than enough material, people, and interest in the Amiga market to support more than one magazine. If they can do a better job, then we don't deserve to be on top. But I'm not convinced that they have fulfilled their promise, and perhaps that is why some of them have stumbled and then vanished while *AmigaWorld* has kept getting stronger.

In 1987, we did two things to get more information out to you. We published our Special Issue, which sold out in record time, and by the end of the year, our management gave us the go-ahead to publish on a monthly basis.

We did increase our techno-coverage in '87, and people appreciated it. Commodore started shipping two new Amiga models last year, which gave the Amiga and *AmigaWorld* a real boost. The A2000 and the A500 were proof that Commodore wasn't completely brain damaged. Somebody (perhaps Gail Wellington) knew that the Amiga was a great machine and didn't deserve to die from neglect.

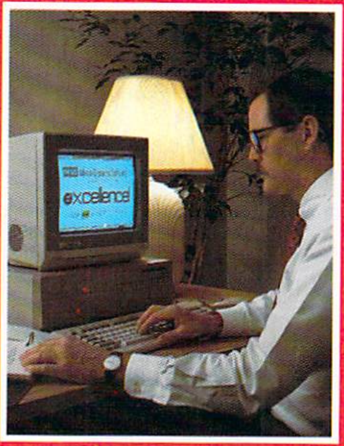
1987 was a good year for *AmigaWorld*. We were finally on a monthly schedule, we had two new machines to write about, and lots of third-party developers were getting charged up again. So far, 1988 has already been a real tempest of activity for *AmigaWorld* (and for the Amiga). We found that our coverage was a bit too technical for all the A500 owners who were starting to read *AmigaWorld*. We changed gears a bit to give you what you wanted. Our C programming tutorials turned into BASIC tutorials. We have been taking advantage of our monthly schedule to give you more timely information through our Notepad section. We are publishing more reviews and new product announcements, and we have been giving you more buyer's guides and lists and charts and comparative reviews than most other publications do in an entire year.

During our first year, all we wanted to do was survive, and we wanted the Amiga to survive. Our goal for the next year was to improve the magazine so that we weren't just fluff. We succeeded. Last year we wanted to go monthly. We did. In 1988, I would like to see the amount of pages in *AmigaWorld* double. Two-hundred or more pages every month ought to be a good start. So far we have achieved every goal that we have set for ourselves, and it might take a bit of whining, cajoling, blackmail, patience, and luck, but we'll give it a good try. The Amiga deserves it, you deserve it, and I would certainly enjoy doing it. Happy third birthday to the Amiga and to *AmigaWorld*. Now blow out the candles and let's eat.

Guy Wright

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Upgrade from Perfect to Excellence!

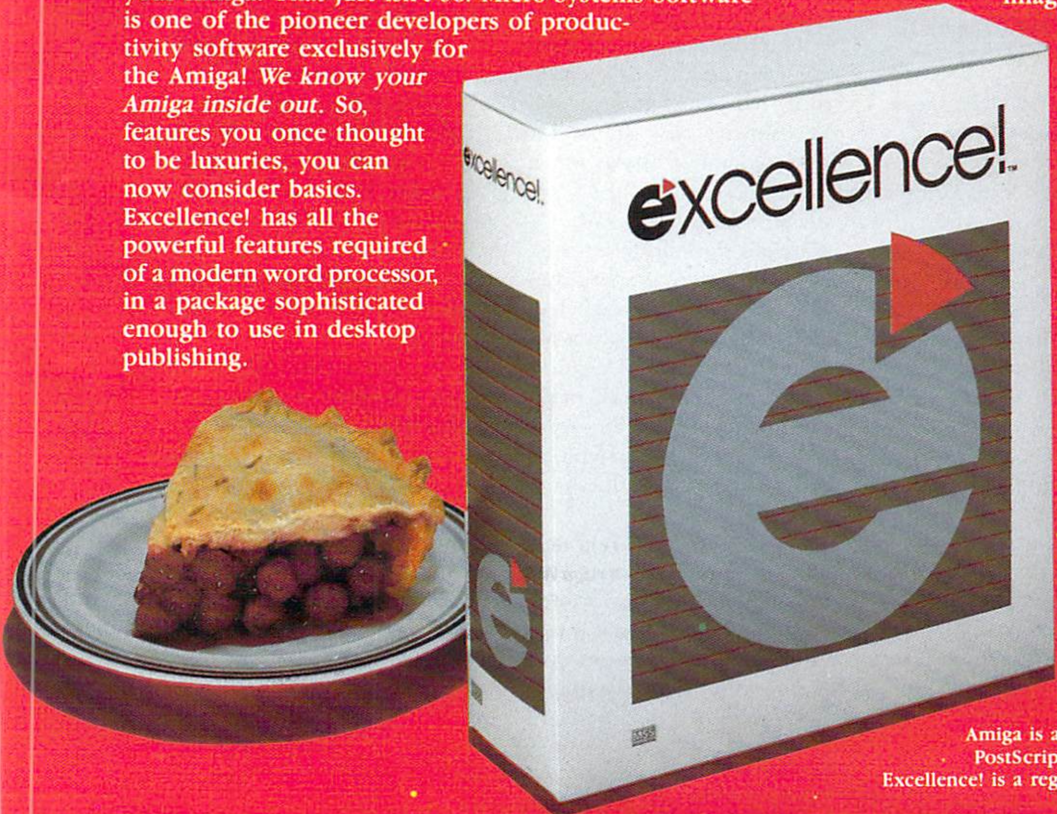


Micro-Systems Software is committed to a higher standard of excellence. And we're ready to prove it! Our newest Amiga product is a full-featured word processor that exemplifies our commitment to the Amiga. And to you. We have appropriately named it excellence! for obvious reasons. First of all, users of our popular word processor Scribble! told us about the features they wanted in a full-featured word processor. So we compiled their suggestions and designed excellence!, a program that sets new standards for word processing. And more importantly, excellence! has been developed specifically for the Amiga, on the Amiga. It takes advantage of the user-friendly Amiga interface and is designed to be intuitive in a way no other word processor can match. An important point: several companies, new to the Amiga market, want you to think their track record with other computer systems makes them instant experts with your Amiga. That just isn't so. Micro-Systems Software is one of the pioneer developers of productivity software exclusively for the Amiga! *We know your Amiga inside out.* So, features you once thought to be luxuries, you can now consider basics. Excellence! has all the powerful features required of a modern word processor, in a package sophisticated enough to use in desktop publishing.

There are always minor differences between programs designed for the same application. *Before* you make your choice, consider these major differences between excellence! and several well-known word processing programs! Excellence! processes words perfectly and does it faster than any other WYSIWYG word processing program available, giving the text-only programs a race for their money! (Not all programs claiming to be WYSIWYG really are. Excellence! shows you *everything*, including super- and sub-scripts, headers, footers, footnotes, colors, and graphics!) Excellence! has all of the standard features too, including: mail merge, full clipboard support, full text styling, multiple methods of movement within documents, search and replace, and printer control! Excellence! has a dramatic collection of features that place it at the forefront of a new generation of full-featured word processsors. Its innovations include: full color support of text, inclusion of IFF graphic images, spelling check as you type, basic math capabilities within documents, multiple column support, proportional font support, Index generator, Table of Contents generator, integrated Thesaurus, integrated Grammatical and Style checker, and PostScript output!

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PostScript Output	✓					
Include Pictures With Text	✓		Limited	✓	✓	
Fully Clipboard Compatible	✓		✓	✓	✓	✓
Multiple Proportional Fonts	✓	Not on screen	✓	✓		
Color Support	✓			✓		
Spelling Check As You Type	✓					
Math	✓	✓				
Multiple Columns	✓	✓				
Index Generator	✓	✓				
Table of Content Generator	✓	✓				
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REPARTEE

Comments, complaints, and concerns

from AmigaWorld *readers.*

Quality-Control Dept.

REGARDING THE LETTER from Fred Kuhlman ["Fat Agnus on the Loose," Repartee, May '88, p. 10], I've had similar seating problems with Fat Agnus, and so have many Amigos I've talked to. In fact, I've had seating problems with *half* the chips in my Amiga. Yes, I did buy my system from a computer store. Yes, it was sealed in its original carton, in its original plastic wrapping when I bought it, so there can be no excuses from Commodore.

The Amiga is a miraculous machine. However, Commodore *must* improve quality control. They have really dropped the ball in this area. An Amiga 500 that is under six months old should still act like it's brand new. Come on Commodore! Let's get back to basics!

Rick Vaida
Grand Rapids, MI

I MUST AGREE with G.L. Isdell ["Losing Faith," Repartee, April '88, p. 10]. I have owned three C-64's. The first one had to be replaced as soon as I took it out of the box. The second one lasted slightly longer.

When the A1000 was first introduced, Commodore chose to disassociate it somewhat from the Commodore name and the 8-bit machines. My first thought was that maybe Commodore was going to take the bull by the horns and produce a top-notch, high-quality machine. Well, my A500 is three weeks old and it's in the shop.

To add insult to injury, the first week I had my A500, I gave an impressive demonstration to a relative who purchased a PC clone with half the features and a price tag $300 higher than that of the A500. He got the last laugh—he's *using* his machine.

What good is a low price if the lack of quality frustrates customers and damages Commodore's name?

B. Witowski
Kalkaska, MI

Bronx Cheers for Dr. Tim

GOLLY! I THOUGHT I had you folks straightened out when I last wrote to you a couple of years ago after you published that tripe on Andy Warhol, and here you go again!

AmigaWorld is probably the best Amiga magazine on the newsstand, but now you go and publish an article on Timothy Leary ["Cyberpunk and Psychedelia," Notepad, May '88, p. 12], the most infamous and despicable of all the advocates of narcotics in our history. I only wish you had printed his picture as he looked in his "prime." This character is probably responsible for the drug deaths of more young people than any other drug advocate of the period. I urge everyone to boycott any product that bears his name, or those of his confederates!

Fred W. Little
Prescott, AZ

IF COMPUTERS ARE one tool for the salvation of humankind, it is frightening to think that the Amiga is Timothy Leary's favorite.

Richard Allen
Navasota, TX

Cable Amiga

I RECENTLY PURCHASED what I now feel is the best home computer on the market today, the Amiga 500.

The other day, while watching a movie on HBO, something happened to my hometown's cable signal. Much to my irritation (I was watching a great movie), the screen turned black. Quickly, I switched through all of the channels to see if anything was still on. The only cable channel that was giving out a picture was the cable TV-guide channel. But I noticed that it was not giving out the usual TV information—instead, it was displaying the title bar of Workbench 1.2.

I was stunned. I had heard that the Amiga is being used in some business applications and that some TV stations were using it for its exceptional graphics capabilities, but I had never thought it would be used in something as widespread as cable TV. This experience has doubled my faith in this terrific home computer.

Jeffrey Doolittle
Nashua, NH

3000 Wish List

I RECENTLY READ a magazine article containing a Lotus 1-2-3 wish list. Then I thought, why not have an Amiga 3000 wish list? Here is mine:

1. 20 Mhz 68020 (or 68030!).
2. 20 Mhz 68881 math processor (or 68882).
3. 1MB RAM (expandable to about 16MB).
4. Five A2000-compatible expansion slots.
5. 640 × 512 pixels non-interlaced (PAL version).
6. Possible resolutions of 1280 × 1024 pixels.
7. Non-HAM video modes capable of 256 colors from a palette of 16777216 different hues.
8. Coprocessors addressing all system memory (no 512K limit).
9. No standard MS-DOS compatibility. An Amiga should be an Amiga!

Bring it to life, Commodore!

Mikael Ohlsson
Stockholm, Sweden

Send your letters to: Repartee, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity. ■

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FOR YOUR AMIGA™

FROM

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You, as Lord Mantrex, must defeat the Tyrans and win back the freedom of Ganymed.

Dealer Inquiries Invited

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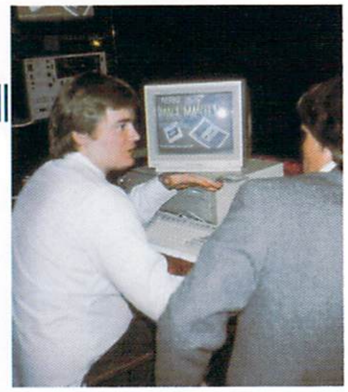
NOTEPAD

Edited by Linda Barrett

Caught At N.A.B.



Commodore put the accent on video at the N.A.B. convention.



A demo of Neriki Image Master's slide-maker program.

WHEN ERIC GRAHAM ray-traced his dazzling animations in Commodore's booth at the National Association of Broadcasters Convention in Las Vegas, video manufacturers began to get nervous. The question buzzing through the multitude of onlookers was whether it was worth investing in high-end systems now that the Amiga was on the scene. Video systems costing from $40,000 to $70,000 touted ray tracing, but their algorithms were simply warmed-over reflectance routines lacking the elegant shadows and absorption algorithms found in Eric Graham's Sculpt 3-D (marketed by Byte by Byte). The only systems with the capacity to do "true" ray tracing were priced well above $100,000. Ironically, none of these systems were capable of running their animations in real time.

Amigas dotted the show floor. Neriki Image Master built a complete turnkey system around the Amiga 2000 with the Polaroid Palette for instant 35mm slides, negatives, prints, and overhead transparencies—a true professional system at the right price. A serious contender in the professional video market, Neriki's Pro-Genlock supports both the NTSC and PAL standards. The 4000 series genlocks from Magni Systems Inc. offer a General Purpose Interface (RS-422) for SMPTE time code, plugging into the video communications standard. Digital Creations demonstrated the Super Gen, a solid performer (see review p. 66). For the cable industry, Compu-Cable-Systems bundled its software with the A1000, dubbing the package the Elite 1000. Associated Computer Services' Accu-Weather, a weather graphics system, looked better than some of the high-end systems, especially when you considered the price.

The Amiga's combination of price and performance is exactly what has sent high-end video manufacturers reeling.

—Joel Tessler

A Masterful Amiga Steals the Show

IN SAN FRANCISCO last April, the main attraction at the West Coast Computer Faire was the show's comprehensive seminars. The most fascinating, as always, were the Masters in Residence series, in which seminar leaders demostrate artistic applications for microcomputers. The main attraction of the Masters series this year was the Amiga.

Chris Palomino, an Amiga artist with Prism Computer Graphics, conducted the Master's Demo for Computer-Aided Art. According to Palomino, "The Amiga represents the state of the art in low-cost computer graphics." At the Master's Demo for Special Effects, Jeff Bruette, Prism's President, demonstrated Very Vivid's Mandala system and an Amiga-based controller for the Fairlight CVI (Computer Video Instrument).

Al Hospers, of Dr. T's Music Software, conducted The Master's Demo for Computer-Aided Music, demonstrating the Amiga 2000's role in composition and performance. Pulling down the screen on which his keyboard sequencer was running, Hospers accessed a voice librarian program, informing the audience "Many computers can control MIDI synthesizers, but the multitasking Amiga is the only one that lets me change the sounds of my instruments at the same time that it plays them."

The Master's Demo for Desktop Video was a crowd pleaser, with NewTek's Video Toaster and A-Squared's LIVE! video digitizer.

Basking in the seminar spotlight, the Amiga proved it is truly a Renaissance computer, proficient in music, video, and graphics, as well as a host of scientific applications.

—Michael Brown

Codename: Cassiopeia

THE SIX TEAMS of developers gathered at C Ltd headquarters, amassing a powerful, integrated Amiga package—a complete 300 dot-per-inch laser system, an ultra-fast printer driver, a SCSI interface, an optional scanner, a FAX/modem, plus CAD, paint, and desktop-publishing programs. Selling for less than $2500, Laser-X-Press (codenamed the Cassiopeia Project) promises to be a "complete solution" for the creative professional market.

If the level of excitement at the mini developers' conference in March was any indication, designers should have had little trouble making the scheduled Comdex unveiling. General Computer Corp. is supplying the laser printer; the driver comes courtesy of Avant Garde Software. Associated Computer Services is perfecting a custom version of their scanner-driver software, while Soft Logic Corp. is working on a special version of its Publishing Partner desktop-publishing program. PAR Software Inc. will supply Express Paint, and Soft Circuits will furnish PCLO and QCAD (a printed circuit board layout program and CAD package). Most important to eager consumers, Southern Technologies will distribute the system.

What makes Laser-X-Press unique is that all of the components can use one, giant bitmapped image area in the Amiga, meaning each program can write to or modify the same image. Once the image is finished, you can save it or dump it to the laser printer.

Beyond the basic system, C Ltd will be selling a 300-dpi optical scanner and a 9600-baud modem card with FAX capabilities. If that isn't enough, C Ltd and the other manufacturers are exploring the possibilities of networking several Amigas to the system.

Contact C Ltd, 723 East Skinner, Wichita, KS 67211, 316/267-6322.

—GSW

C Programmers Unite!

TIRED OF RE-INVENTING the wheel? Is your program just one little routine away from completion? The C Programmers Association (C-PRO) may be able to help.

C-PRO gives its members access to hundreds of general and machine-specific C routines. You can purchase any quantity, from a single routine to an entire group, and order them through C-PRO's 24-hour bulletin board distribution system.

C-PRO tests all its C routines for usability, efficiency, and bug-free operation. The routines are licensed to C-PRO members only, and only members can include them in programs intended for commercial distribution.

You can also submit your own C routines to C-PRO. Upon favorable review, C-PRO will distribute your routines and give you a percentage of the profit from sales. For more information, call or write to: C Programmers Association, 10668 Ellen St., Suite A, El Monte, CA 91731, 818/442-1522.

—SL

Truth In Advertising?

JEFF WILLETTE of Grand Haven, MI discovered the following Freudian slip in the classified ad section of *The Muskegon Chronicle*.


814—Home Computers

COMMODORE 64 SYSTEM — Complete with software, $450.

TANDY 1000 — With 128K, 2 drive unit, with screen, $1300.

824—Antiques

AMIGA 1000 — With Amiga monitor, 2400 baud modem, printer, disks and accessories. $1150

828—Buildi...

Golden Gate to Video

THE AMIGA WAS RUBBING keyboards with the big boys earlier this year in San Francisco at the 10th annual Video Expo. The week-long trade show, covering all aspects of professional video production, featured exhibits by such industry giants as Sony, Ampex, Panasonic, and JVC. In addition to drawing big crowds on the main floor, the Amiga starred in a desktop-video seminar.

The video industry is beginning to recognize the Amiga as a useful tool, but will it be satisfied? At the show, everyone familiar with the computer agreed: If the Amiga produced higher-resolution graphics and used a faster microprocessor, it could become a phenomenal success in the video production market. The question becomes, will Commodore spend the research and development dollars needed to meet the challenge?

With the Macintosh II and Atari ST turning their monitors towards desktop video, can Commodore afford not to?

—Michael Brown

HORS D'OEUVRES

Hints, tips and techniques

from your fellow Amiga users.

SOUND FILTERS

I'VE BEEN READING lately about how the filter on the sound channels can be turned off. Well, if you are using BASIC, you can do this with a POKE statement. POKE 12574721,254 turns off the filter and poke 12574721,252 turns it back on. I have written a program that lets you do this on the fly while you play a music program in the background:

```
10 A = 12574721
20 ONFIL = 252
30 OFFIL = 254
40 K$ = INKEY$
50 IF SWITCH$ = "" THEN
  GOTO 40
60 POKE A,ONFIL
70 IF K$ = "\" THEN POKE A,OFFIL
80 GOTO 40
90 END
```

Obviously, this program could have been written a number of different ways (even without the line numbers). As long as you keep the numbers straight, it should work on the 500 and most 2000s (otherwise expect to crash the machine). I was told that it makes the red light dim, but on my 500 it goes out completely. Does anyone know why this happens?

Brian Akey
Sycamore, IL

TRANSPARENCY SKETCHER

WHEN SKETCHING ON the screen with DeluxePaint, I find it difficult to keep the various parts of my sketch in proportion. To make this job easier, I use a technique that I worked out on the C-64.

Draw your picture on a piece of transparent plastic, such as an overhead projector transparency, using a marker designed for use on this kind of material. A piece of white paper underneath the transparency makes it similar to drawing on a blank piece of paper. Or you can trace an existing picture. Then, tape the plastic to the monitor screen. Using the transparency as a guide, draw your picture on the screen with the mouse. Then, remove the transparency and use the mouse to color and shade the picture.

Use a light-colored marker (I like red) so that, as you copy your sketch onto the screen, you will be able to see the lines of your on-screen drawing underneath the transparency. This method is a bit cheaper than a drawing tablet and gives similar results.

Jo-Anne Park
Toronto, Ont., Canada

CTRL KEYS

HERE ARE SOME key combinations that you might find useful:

CTRL-g (ascii 7) flashes the screen
CTRL-k (ascii 11) cursor up
CTRL-l (ascii 12) clear screen
CTRL-n (ascii 14) Alt lock
CTRL-o (ascii 15) Alt unlock

LeftA-n moves Workbench screen to front
LeftA-m moves Workbench screen behind
LeftA-v Retry on system request
LeftA-b Cancel on system request

You can, for example, use the CTRL combinations in text files or in ECHO or PROMPT commands. Try this example in the CLI. Type:

```
PROMPT "
```

Then hold CTRL and press k 23 times. Then type:

```
1>"
```

and press the Return key. Now try some CLI commands and see what happens. Commands with long output will make the screen messy.

Petter Urkedal
Vatne, Norway

WORDPERFECT PRINTER CHANGES

IF YOU USE WordPerfect, here is a little piece of information that will become valuable if you buy another printer. As you know, WordPerfect lets you set up your printer choices once, and then you don't have to worry about it again. But if you start using another printer, the program won't let you add the new printer to the printer choices you made the first time around. The manual doesn't help, but it does state that your printer choices are saved in three files on your WordPerfect disk (not the printer disk!).

To add your new printer to your choices, load the Workbench disk and enter the CLI. Put the WordPerfect disk in DF1: and type:

```
cd df1:
delete sfeed.prt
delete sfont.prt
delete sprinter.prt
```

Then reboot using the WordPerfect disk. When you select anything from the Print Menu, WordPerfect will search for these files, and, not finding any, it will then ask for the printer disk. Insert the disk and select your new printer choices.

Bob Robinson
London, Ont., Canada

If you have an idea you'd like to share with our readers, send it to Hors d'oeuvres, AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458. If your idea gets published, you'll receive an* AmigaWorld *surprise gift.* ■


GODZILLA MEETS DAN RATHER
YOU WANT LIVE ACTION, FAST MOTION, AND SPECIAL EFFECTS, AND YOU WANT IT ALL AT ONCE. INVISION™ GIVES IT TO YOU.
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NEITHER DAN RATHER NOR GODZILLA ENDORSE THIS PRODUCT. AMIGA AND LIVE! ARE TRADEMARKS OF COMMODORE/AMIGA, INC. AND A-SQUARED SYSTEMS RESPECTIVELY.

LIVE!

Worth waiting for.

By Ted Salamone

LIVE! IS A real-time digitizer and frame grabber for the Amiga 1000. It produces black-and-white, colorized, and true-color displays. Color output isn't limited to 16 or 32 colors either, as Live! offers a very flexible Hold-and-Modify (HAM) mode.

The few requirements include an NTSC (National Television Standards Committee) video signal and a cable to link the video source. Though 512K of memory gets you into the club, additional RAM brings rewards such as extended capture capabilities and faster processing and playback speeds.

You can draw the NTSC RS-170 video source from any VCR, laser disk, or camera rated for use in the United States (standards such as PAL and SECAM will not work with Live!). Video cables should be shielded to prevent destructive interference, and standard male RCA audio/video connections are required.

Live! snaps into the side expansion port. In my tests Live! performed flawlessly hooked up to a two-megabyte RAM device with pass-through. The digitizer itself does not have a port for adding other devices. Live! draws its power from the Amiga. The front of the unit has non-gold-plated video in and video out female RCA connections; one accepts the NTSC signal, the other drives it to a genlock, monitor, or VCR.

DOCS IN NEED OF DOCTORING

The manual is error ridden; menu and command descriptions are completely inaccurate in many instances, and organization is lacking.

The poor coordination between what is written in the manual and what appears on screen had me going in circles. Representative of this is a menu that is called Settings in the manual, but referred to as Controls on the screen. Within this menu, the Adjust Levels command described in the documentation appears on screen as Video Signals; Mouse Tinting and No Mouse Tinting commands are replaced by a toggle, and the two Info commands aren't even noted in the manual.

The Quickstart section, intended to get you up to speed quickly, leads you to believe that the Live! disk autoboots. It doesn't. You must open the disk icon and select the Live! icon from within.

SAVE, PLACE, AND SHOW

The non-copy-protected Live! disk contains programming information and related details so you can build your own Live! software, plus the main program, a public-domain utility called Playriff, and files to explain things not covered in the manual.

The main program allows Live! to display, save, and capture images in black-and-white, color, or HAM modes. With it you can change color palettes, create special coloring effects via mouse or keyboard, colorize black-and-white images, and save IFF images to disk.The ability to save color and level settings to disk ensures the integrity of a project; each image can be done on a separate disk so that changes to one won't effect others.

The default resolution is 320 × 200, though 320 × 400 is just a click away. A Setlace (interlace) command is included, just as in the CLI. The user-definable dis- ►



Live! can capture your image in a number of ways.

play defaults are set at 15 frames per second in black-and-white and 12 frames per second in simple-color mode. A Smooth Images command achieves anti-aliasing; other commands switch between the 16-gray-level black-and-white mode, 32-color mode, and the 4096-color (HAM) mode.

Through the Settings menu you can adjust the video signals, alter the color palette for use with a genlock, and colorize. Colorizing lets you control luminance (brightness), saturation (density), and hue (RGB cycling). Color maps, accessible via the left mouse button, introduce a wild series of mixed effects. The 12 maps range from light zebra blues to garish crayon and gray negative.

The Pause function enables you to pull the screen down to access the CLI, Workbench, or whatever is below. There are a good number of command-key alternatives in the software.

The Capture menu provides the means to save images or animation sequences to memory or to disk, play them back (from RAM only), designate the number of frames to capture, and free the RAM for another use. Saved to memory, each frame takes 40K; with 512K of RAM, you can save four frames. To give you an idea of the duration of such animation sequences, 55 frames will run for 3.6 seconds. When saved to disk, the Playriff utility compresses the data by 50% or more.

Playriff will replay the file one frame at a time or in a non-stop sequential mode. The utility also lets you append one captured sequence to another, doubling the playtime. (You can view sequences without Live! by including Playriff on the video-image disk.) Another option allows you to change images, one frame at a time from the utility's format to standard-IFF, for inclusion in any Amiga paint program.

Live! performed admirably. Connected to an 8mm Sony CCD-V3, the digitizer worked its magic from black-and-white to colorizing to HAM, from 320 × 200 color to 320 × 400, and from smooth to fast images. Most amazing though, was capturing a sequence in RIFF mode and replaying it. Other advanced features make use of genlock devices. Pointing a video camera at the monitor connected to Live! (thus filming yourself filming) puts you in what the manual calls the Feedback Zone. The result is unusual, to say the least.

Live! is a remarkable piece of equipment for a few hundred dollars. The manual needs an overhaul, but construction and performance run from very good to excellent, and Playriff is an exciting and valuable bonus.

Live!
A-Squared Distributions
6114 La Salle Ave., Suite 326
Oakland, CA 94611
415/339-0339
800/452-4455
800/626-9541 in California
$299
512K required.

SHAKESPEARE

Dramatist? Poet? No, desktop publisher!

By Chris Dickman

WHAT'S BEEN MISSING from the desktop-publishing world is a program to produce pages of color text and graphics. The curiously named Shakespeare, by Infinity Software, is such a program. Shakespeare lets you combine text and Interchange File Format (IFF) graphics, manipulate and then print them on a color or PostScript-laser printer.

Color inkjet and thermal printers are suitable for creating fairly good-quality pages in limited quantities. If you have a PostScript printer though, the situation is different. Shakespeare lets you use high-quality PostScript fonts, and converts all IFF graphics into gray-scaled images (which the manual mistakenly calls halftones). Shakespeare's handling of type verges on primitive, but the ability to bring IFF graphics into the PostScript environment will endear it to many. Professional Page (The Gold Disk) also has this capability, but at more than twice the price.

The Shakespeare screen is similar to most desktop-publishing applications. The display is bordered on the top and left by rulers that can measure by inches or picas. To the right and bottom are scroll bars for navigating the page. You can perform operations with the aid of menus, or by using the icons in the on-screen toolbox for such common tasks as moving and resizing objects.

LOOK AT IT THIS WAY

A key to creating with a desktop-publishing program is the ability to move easily between diverse views of the page. Usually these include an overall view and a handful of magnifications. Shakespeare is a bit peculiar, in effect providing only two options. The default view depends on which of four screen resolutions you've selected. For those using non-interlaced monitors, that means tired old 600 × 200, producing an extreme three-to-one aspect ratio—reducing the "what-you-see-is-what-you-get" principle to rubble. Other views are obtainable only by changing resolutions, a jarring experience that doesn't really compensate.

The method for surveying an entire page, on the other hand, is elegant. You can pop up a small window at any time to display the page in miniature, with an outline denoting the section currently on screen. Even better is the ability to display any other page in this window, and resize or move it.

At the heart of any desktop-publishing program is the ability to combine text and graphics files. Shakespeare accepts files from most Amiga word processors by stripping them of control codes, leaving text in ASCII form. The drawback is that any formatting entered with a word processor, such as tabs or underlining, will be lost. Filters should be added to Shakespeare to keep popular formatting intact.

What distinguishes Shakespeare from the other programs that attempt to mix text and color graphics is the way it transcends the Amiga's ability to display only a subset of the potential 4096 colors at Workbench resolutions. Shakespeare remembers each image's palette information. If you have graphics with different palettes on one page, as you click on each, it (and the rest of the screen) will be displayed using that particular set of colors. Even though you can only display one palette at a time on screen, each graphic will print in its own colors.

This is an ingenious way around the Amiga's limitations (although it is difficult to visualize your page because not all images appear correctly colored on screen at once). Shakespeare accepts any ►


COLOR FILM
FOR COLOR SLIDES

IFF graphics file except HAM (Hold-And-Modify), but expects the image to have been saved as a brush; non-brush graphics displayed unpredictably.

Shakespeare uses the frame technique to contain text and graphics on the page. Frames are boxes that define the boundaries of a page element and let you manipulate it in a number of ways. You can move, size, delete, and copy frames and their contents, and in the case of graphics you can crop, too. You can also drag one frame over another, make it transparent or opaque and then send it behind or bring it in front.

Once you've organized your page, fun with color begins. The procedure involves placing a number of graphics on a page, setting the palette for the entire document to achieve overall uniformity, then adding graphics that need to keep their palettes intact. Changing a palette brings up a requester displaying 32 color squares in medium-resolution mode (16 in hi-res), which correspond to the Amiga color registers. By selecting a color and adjusting the RGB sliders, you can change the palettes of frames, pages, or entire documents.

Shakespeare allows you to change colors on a character-by-character basis. To color any block of text, simply click and drag over the area, then select your color. Another requester lets you apply color to borders and backgrounds of both text and graphics frames.

FRAMED TYPE

Whether rainbow-hued or basic black, type is the most important part of any document. When you load a text file into Shakespeare and create a frame on the page, the frame fills with text. Create another frame and it picks up where the first leaves off, so that resizing any frame affects the text in subsequent ones. This principle, known as dynamic linking, is used by all desktop-publishing software worthy of the name. So far so good.

You can highlight and edit text within a frame with the usual cut, copy, and paste commands, change the style to bold, italics, or underlined, or alter the type face and size. Shakespeare displays both Amiga fonts and those following the ColorFonts standard, which can use up to 16 colors. All fonts display very legibly, but the typographic controls available are virtually nil. There's no hyphenation, for example, so justified text often contains unsightly gaps between words. You can change interline spacing, but Shakespeare measures in screen pixels instead of the more accurate typographical measure of points.

The program's support for PostScript printers is less than thorough, although version 1.1 promises to address such limitations. You're stuck with Amiga screen fonts for now, which are monospaced in contrast to proportionally-spaced laser-printer fonts. (Infinity says that a separate five-disk set of fonts is forthcoming.) Shakespeare thus can't use PostScript font-width tables, and is forced to guess how to display text on the page and in your documents. Typographic niceties like kerning accordingly go out the window. On a brighter note, you can save your document as a pure PostScript file and have it printed by a laser service. This might be the route to go if you use Shakespeare mostly for color printing

Continued on p. 64

BASIC By The Numbers

If you think event trapping has something to do with little furry animals, read on as we examine menus and events.

By Bob Ryan

39 Can I Take Your Order?

FIRST POPULARIZED ON the Apple Macintosh, pull-down menus provide an easy way for people to interact with and control computer programs. Your Amiga provides support for menus through the Intuition library, which is used by most commercial C and assembly-language programs. Amiga Basic's MENU commands and functions use these same Intuition functions, giving you the ability to write programs that rival commercial packages in their ease of use.

Before you use a menu in Amiga Basic, you have to define it. This is the purpose of the MENU statement, which has the syntax:

```
MENU menu-id, item-id, state, title
```

Menu-id identifies the menu. The first menu on the menu bar is numbered 1. Item-id refers to the items within the menu. Item 0 is the name of the menu; subsequent items are options you can choose when you access the menu. The state is a number from 0 through 2. A menu item with state zero is disabled—you cannot access that item. If the item disabled is item 0, the entire menu is disabled. Items with state 1 are accessible by the user. Items with state 2 are also accessible, and appear with a check mark to the left of their title. You must leave a couple of spaces to the left of your title if you use state 2 items. Note that you cannot use state 2 with menu items numbered 0. Here is a short program that defines two menus. Try it out.

```
MENU 1,0,1,"My First Menu"
MENU 1,1,1,"Item 1 of my first menu"
MENU 1,2,0,"Item 2, and it's disabled"
MENU 1,3,2,"  Item 3, with a check mark"

MENU 2,0,0,"My Second Menu"
MENU 2,1,2,"  Everything is disabled"

Loop:
GOTO Loop
END
```

This program doesn't do anything but create two new menus on your output window. Use your mouse to look at the menus. Active menus are complemented when you move the mouse over them; disabled menus are hashed out. Note also that although you have overwritten the first two default menus on the output window, the last two are still displayed and still active. You can use Stop from the Run Menu to stop the program. You can restore the default menus completely by entering MENU RESET into the output window.

In addition to demonstrating menus, this program points up some of the idiosyncrasies of Amiga Basic menus. These menus are not tied to any window or screen. If your program opens multiple windows and screens, you will get the same menus no matter what window is current or active. Also note that you must overwrite a preexisting menu in order to get rid of it. Many times, you will define dummy menus with null strings ("") for titles in order to overwrite the default menus.

One final caution: You will get some very strange effects if you don't watch the width of your menus. You may find your menus wrapping around the screen if you make them wide or use them on a 320-pixel-wide custom screen.

40 Event Trapping

DEFINING MENUS IS nice, but you need more information to actually use them. The Amiga Basic manual gives two methods for getting input from menus: polling and event trapping. I'm going to ignore polling, as should you. The proper way to program the Amiga in any language is to use event trapping.

Event trapping is a very important concept. Using it, your programs do not have to constantly check to see if the user has selected a menu item or clicked the mouse button. The Amiga system checks these things for you and reports them when they occur. Your program can then handle the event—perform some action based upon a menu selection, for example—before returning to normal processing. As you learn more Amiga Basic, you will find yourself writing programs that do nothing but wait for events and then respond to these events as they occur. ►

Express Paint

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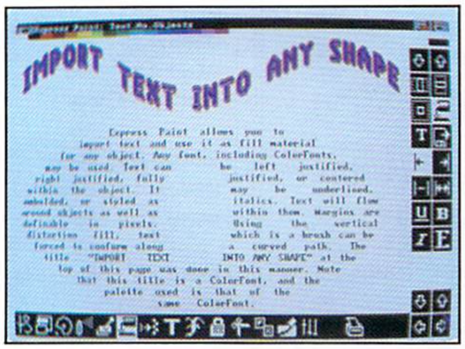


changes. In no time, you could easily find yourself creating stunning 64 color masterpieces like the one above.

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$99.95

Developed by:

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	Express Paint	Deluxe Paint II
PostScript compatible	Yes	No
Reduce/enlarge print	Yes	No
Poster-size print	Yes	No
Vertical page size (pixels)	Unlimited	1024
Horizontal page size (pixels)	8192	1024
Extra Half Brite Mode	Yes	No
Unlimited locks	Yes	No
Multiple active brushes	Yes	No
Text importing	Yes	No
Text justification	Yes	No
Half circles	Yes	No
Arrowheads on lines	Yes	No
Numerous line patterns	Yes	No
Copy protected	No	Yes

Order today and find out why more people think Express Paint is the graphics program of choice.

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41 Working Menus

TO DEMONSTRATE HOW menus and event trapping works, I've written a short program called Sentence Maker. The program sets up five menus and then waits in a WHILE. . . WEND loop for you to choose items from the menus. When you select a menu, the program branches to the corresponding subroutine, performs the activity specified by the menu selection, and returns to the wait loop. Try the program yourself.

```
REM Sentence Maker
MENU 1,0,1,"Articles"
MENU 1,1,1,"the"
MENU 1,2,1,"a"

MENU 2,0,1,"Nouns"
MENU 2,1,1,"boy"
MENU 2,2,1,"dog"
MENU 2,3,1,"ball"

MENU 3,0,1,"Verbs"
MENU 3,1,1,"chased"
MENU 3,2,1,"hit"

MENU 4,0,1,"Punctuation"
MENU 4,1,1,"."

MENU 5,0,1,"Quit"
MENU 5,1,1,"Yes"
MENU 5,2,1,"No"

ON MENU GOSUB checkmenu
  MENU ON
  x= 1:WHILE x= 1:WEND
  MENU RESET
END
checkmenu:
Z=MENU(0)
ON Z GOSUB M1, M2, M3, M4, M5
RETURN

M1:
  IF MENU(1)= 1 THEN
    PRINT "the ";
  ELSE
    PRINT "a ";
  END IF
RETURN

M2:
  IF MENU(1)= 1 THEN
    PRINT "boy ";
  ELSEIF MENU(1)= 2 THEN
    PRINT "dog ";
  ELSE
    PRINT "ball ";
  END IF
RETURN

M3:
  IF MENU(1)= 1 THEN
    PRINT "chased ";
  ELSE
    PRINT "hit ";
  END IF
RETURN

M4:
  PRINT CHR$(8);"."
RETURN

M5:
  IF MENU(1)= 1 THEN x= 0
RETURN
```

The first part of the program sets up the five menus. Notice that the zero item of any menu is the name that appears in the menu bar. The other items are the contents of the menu. Once the menus are set up, the program indicates the name of the routine that will handle menu events with the ON MENU GOSUB statement, turns on menu event trapping with the MENU ON statement, and then settles into a seemingly infinite WHILE. . . WEND loop, waiting for some input.

You supply the input by choosing items from the menus. This program takes the words and punctuation you select from the menu and strings them together into sentences. When you select a menu item, the program jumps from the WHILE. . . WEND loop to the checkmenu routine specified by the ON MENU GOSUB

statement. Here, the program uses the MENU(0) function to see which menu was chosen. It uses a standard ON GOSUB statement to branch to the correct menu-handling routine.

Once in the proper menu-handling routine, the program uses the MENU(1) function to discover which item from the menu was selected. It then takes the appropriate action—in this case, printing the proper word or character on the screen. Notice that when the period is selected, the PRINT statement issues a backspace before printing the character and a carriage return afterwards. All the menu routines return to the checkmenu routine, which returns control to the WHILE. . . WEND loop.

The WHILE. . . WEND loop will not end (and consequently the program will not end) while the value of x is 1. The only place this value changes is in the M5 routine. If item 1 (Quit) is selected from menu 5, the value of x is changed to 0. This causes the program to exit the WHILE. . . WEND loop when the program returns from the checkmenu routine. Once out of the loop, the program resets the default Amiga Basic menus with MENU RESET and ends.

This program demonstates the basics of menu handling and event trapping. In future issues, as programs become more complex, we'll be using event trapping more and more frequently.

42 Insomnia

ONE PROBLEM WITH my Sentence Maker is the fact that the program spends a lot of its time doing nothing. Most of the processing in the program consists of running through the empty WHILE. . . WEND loop. This ties up system resources—a high crime (or at least a misdemeanor) on the Amiga. Amiga Basic does provide a statement, SLEEP, that shuts down a program until a trappable event occurs. I had no problems using SLEEP in my WHILE. . . WEND loop until I wanted to quit the program. Then, SLEEP required an extra event—another menu selection or a mouse click—in order to reactivate and exit the program. Because I do not want the user to have to enter extra events, I dispensed with the SLEEP statement.

43 Wrap-Up

A NUMBER OF readers have pointed out a mistake I made in the March '88 installment (see "Basic By The Numbers," p. 17, in the March '88 issue of AmigaWorld*). In Number 16, I use an array called name$. This doesn't work. Because NAME is an Amiga Basic command, you cannot use it as a variable name. As I never use the NAME command, I didn't know this. I do now. Thanks to those of you who set me straight.*

Next time, I'll take a look at the Amiga Basic's object-animation commands. Until then, direct your questions and comments (and corrections) to Basic By The Numbers, AmigaWorld*, 80 Elm St., Peterborough, NH 03458.* ■

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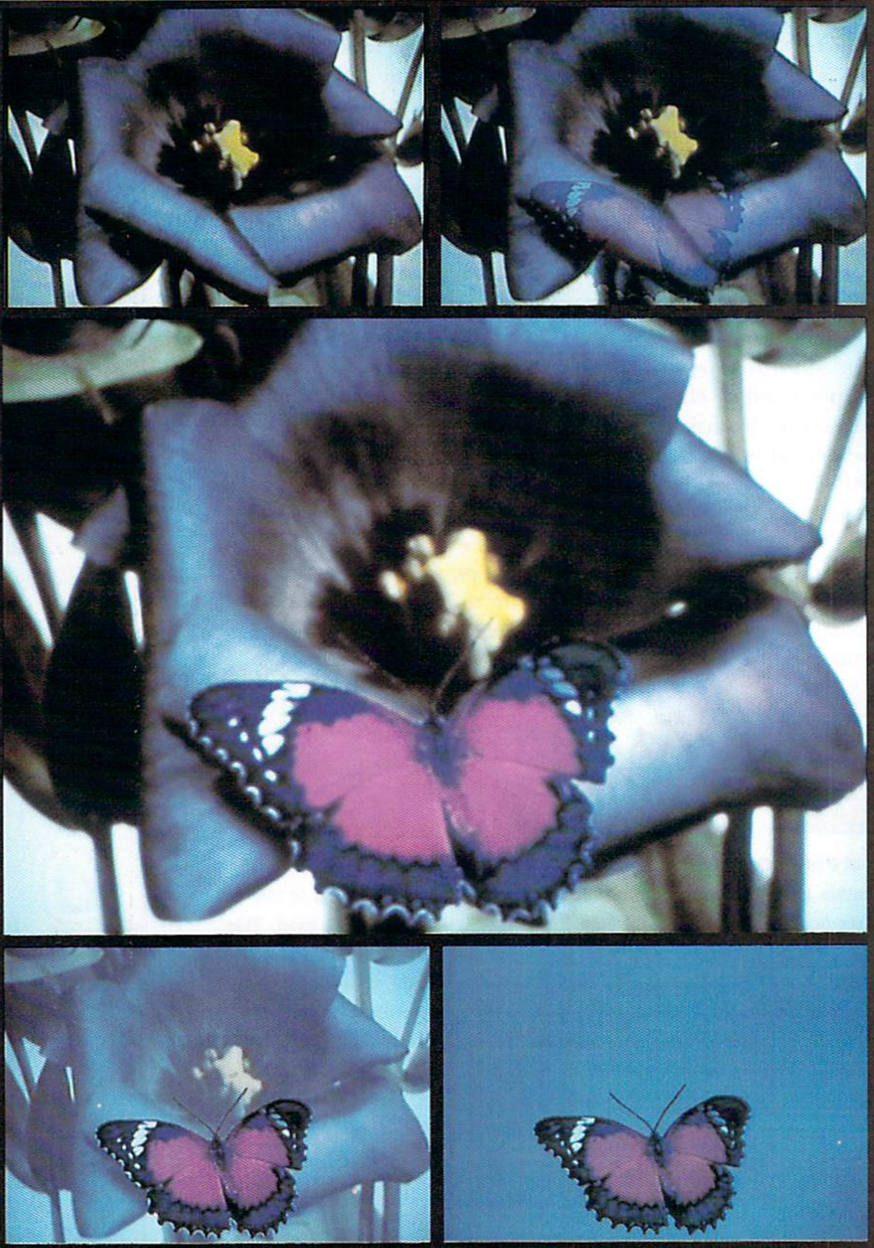
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SPECIAL
PRINTER
REPORT-1

LASTING IMPRESSIONS

WITH PRICES FALLING IN THE HIGH-QUALITY, BLACK-AND-WHITE PRINTER MARKET, SOME 24-PIN DOT-MATRIX AND LASER MODELS ARE NOW WITHIN AFFORDABLE REACH FOR MANY AMIGA USERS.

IDEALLY, YOU WOULD like to buy a printer that produces beautiful color graphics and typeset-quality text. Ideally, you'd have the cash to buy such a printer. But this isn't an ideal world, so buying a printer involves making a series of compromises that would impress Henry Clay. Do you want easy control or advanced capabilities? Is speed more important than quality? Do your printing needs lean towards graphics or text? Dot-matrix or daisy wheel or ink jet or laser?

We won't be able to answer *all* those questions in a single article, so we will limit the comparative reviews that form the major emphasis of this feature to high-quality but generally affordable black-and-white printers that can handle fairly sophisticated text and graphics needs. This will narrow the focus down to 24-pin dot-matrix and laser printers. By way of introduction, however, we will look at these two in relation to other printer technologies to help you understand the wide variety of printer capabilities and make the right choice for your printing needs. ▸

BY LINDA BARRETT, BOB RYAN, AND LOUIS WALLACE

PHOTOGRAPHED BY PAUL AVIS / STYLED BY JANE SUTTON

Enough Impact

Printers are classified by how they form text and graphics on the page. On the low end are nine-pin impact dot-matrix printers. Best exemplified by the Epson MX series, these printers have a column of nine pins that strike the ribbon against the paper, forming different characters or images depending upon which pins strike. Nine-pin dot-matrix printers are popular because they are cheap, fast, dependable, and can print graphics. For home use, you can get by with a nine-pin dot-matrix printer, although you should be aware that reading nine-pin generated text has been shown to cause blindness in laboratory mice.

Offering improved speed and output over the nine-pins, 24-pin dot-matrix printers have two rows of 12 pins each. As one row is slightly offset from the other, the printer in effect has 24 vertical pins to form text and graphics. More pins means better quality and more speed in draft mode. With retail prices of some 24-pin dot-matrix printers dropping below $500, the days of nine-pin printers are surely numbered. Software developers who spend hours pouring over listings in search of elusive bugs will appreciate the speed and quality of the 24-pin printers.

If you need letter-quality output and do not mind waiting, daisy-wheel printers have fully-formed characters arrayed at the end of spokes on a wheel. The wheel rotates the proper character into position where a hammer pounds it into the ribbon, similar to many popular typewriters. Daisy-wheels, also called letter-quality printers, were once the top of the line printers, but they have generally been supplanted by faster lasers and 24-pin dot-matrix printers.

The Heat Is On

Thermal-transfer printers and ink-jet printers form characters and images from dots, but they differ from impact dot-matrix printers in that they do not have pins that strike a ribbon. Thermal-transfer printers, such as the Okimate 20, are similar to nine-pin dot-matrix printers, but instead of striking the ribbon, the heated pins push the ribbon close to the paper. Physics does the rest in transferring

ADJUSTED PREFERENCES

WITH VERSION 1.3, Commodore gave Workbench a tuneup and many of the improvements are under the hood in Preferences. The software mechanics exterminated several bugs, turbo-charged the printer drivers, and rebuilt the Graphics 2 screen.

Depending on the printer and the type of graphic dump involved, you can expect speed increases of three to 20 times faster than 1.2 drivers. Output speed should now be limited only by the printer and not the Amiga. The new Printer Device can support screen sizes up to 2048×2048 pixels with up to 12 bit planes, well beyond the Amiga's display capabilities. Perhaps this is an indication of things to come.

For those interested in accuracy over speed, the Graphics 2 screen contains a number of gadgets that let you customize graphic dumps. The Left Offset and Center toggles align the image on the page, while the effect of the Density gadget's seven buttons is dependent on your printer. Some printers, such as the Canon PJ-1080A, have only one setting, in this case 83 dots per inch (dpi). For common nine-pin dot-matrix printers, button one selects 120 dpi while button two selects 240 dpi. Four buttons are active with the 24-pin Epson compatibles, setting the dots per inch to 90, 120, 180, and 360. In all cases, the vertical pin spacing of the printer limits the vertical density. You can cheat the system for Epson and IBM graphics compatibles and set them to vertically overlap by ⅓ of a dot on successive printhead passes. On the first Preferences printer screen, set the Paper Type gadget to Single as opposed to Fanfold.

No longer are you locked into an Ordered Dithering pattern for gray scale or color printing. Besides the version 1.2 standby, you can choose Halftone Dithering, which creates an effect similar to that used for newsprint graphics, or Floyd-Steinberg (F-S) Dithering, which generates a random appearance especially suited for fleshtones in digitized images. The new dithering techniques work best with high-resolution printers. Turning on Anti-aliasing minimizes the staircasing effect of square pixels on a diagonal line, but decreases printing speed by a factor of two.

For color printing, the balance of the printer inks makes it impossible to reproduce accurately all 4096 on-screen colors with Ordered Dithering. Most color printers will get the reds and greens right at the expense of the blues. The Color Correct gadget lets you adjust the dithering patterns for the ink colors. You must, however, trade off the number of colors that can be rendered uniquely for accurate hues.

the melted ribbon to the paper.

Ink-jet printers (Xerox 4020, Hewlett-Packard PaintJet, Canon PJ-1080A) form images by spraying dots of ink onto paper. The forte of ink jets, however, is color printing. While color dot-matrix printers tend to produce streaky, washed-out graphics, the graphics output from color ink-jet printers is usually excellent. Although ink-jet printers are fast, quiet, and produce quality output, they are expensive and have greater maintenance requirements.

LASER LETTERS

At the top of the line in printer technology are the laser printers, which resemble photocopying machines in operation as well as looks. A laser beam inside the printer changes the charge on a drum, which causes the drum to attract toner to the areas the laser strikes. The toner is then transferred from the drum and bonded to paper. Lasers offer a superior combination of speed, quality, versatility, quiet operation, and high-density graphics. Of course, you pay for what you get.

Lasers come in two major styles: Hewlett-Packard (HP)-compatibles and Postscript machines. Hewlett-Packard produced the first desktop lasers and continues to dominate the market. The HP LaserJet and compatibles couple multiple fonts and styles with excellent graphics and text quality. In effect, they are super letter-quality printers. Given their versatility and prices starting around $1500, they have just about killed the high-end daisy-wheel market.

PostScript lasers such as the Apple LaserWriter IINT are actually low-end typesetting machines. PostScript, a page-description language, lets you control all the elements of a printed page. With PostScript, you can scale your fonts to just about any size, incorporate rules and boxes into the page, and mix text and graphics easily on the same page. Although PostScript is notoriously slow printing bitmapped graphics, PostScript printers are far more versatile, powerful, and expensive than non-PostScript lasers.

Unlike other lasers, PostScript printers are normally controlled directly from an application program; you can't access the power of PostScript from an ordinary Workbench printer driver. Because they are software controlled, you cannot do better than a PostScript-compatible laser for desktop publishing. You also will be hard-pressed to find a more expensive printer. HP-compatible printers are cheaper, but they don't give you the same control over the printed page.

When all three of the correction buttons are turned on, the software can generate only 3172 unique colors.

To control the size and aspect of graphic dumps, you can still use the old system, based on the margin settings in the first printer screen. Choose the Fraction gadget under Scaling and the Ignore gadget under Limits. Choosing the Integer gadget under Scaling insures that every screen pixel will have an even number of dots when printed.

The interpretation of the values entered into the Width Limit and Height Limit requesters depends on the Limits gadget you select. Bounded sets a maximum size for the printout as per the number of inches in the requesters, but the actual size of the graphic dump may be smaller than what has been entered. The Absolute gadget takes the values in the requesters as the actual size of the graphic dump in inches. Pixels interprets the values as the absolute size of the graphic dump in printer pixels. The Multiply gadget uses the values to control the number of pixels to be printed for every screen pixel. Refer to the accompanying sidebar, "Dots Enough", for a specific example of how you can use these settings to get the best printed image possible.

—Morton Kevelson

DOWN TO CASES

Once you know the type of printer you want, you'll still have scores of models to choose from. Be sure you select a printer that works with one of the Amiga Workbench printer drivers. Your printer should either be listed in Preferences or emulate a printer that is listed in Preferences. For PostScript lasers, be sure your desktop-publishing software supports the page-description language.

Now that you know the proper questions to ask, you need some answers. In the past, *AmigaWorld* has published a round-up of color printers (see "Graphic Hardcopy and the Amiga," p. 36, in the March/April '87 issue of *AmigaWorld*) and reviews of high-quality color printers (Okimate 20, p. 79, May/June '86; Xerox 4020 Color Ink Jet, p. 69, September/October '87; HP PaintJet, p. 18, April '88). This time around, we will focus on the black-and-white scene. In the next two sections, we examine five popular 24-pin dot-matrix printers and four laser printers, respectively. Between the reviews and some informed shopping, you should be ready to join the ranks of those who have something to show for all the long hours spent in front of their Amigas. ►

24-PIN DOT-MATRIX PRINTERS

DECIDING WHICH PRINTERS to evaluate was no mean task. Prices vary considerably, as do speed, features, and durability. In the end, we decided—with the exception of the Okidata Microline 393—to concentrate on popular mid-range printers. These models, priced from $700 to $1200, are not a terrible financial burden for home users and are rugged enough to stand up to heavy office use. The five printers we chose to evaluate were the ones we've received the most questions about from readers. The information falls into four parts: a short description of each printer, a specifications chart, speed comparison graphs, and examples of graphics output.

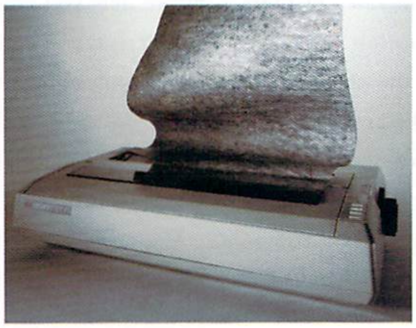
FOOTNOTES

WE INCLUDED THE Okidata Microline 393 as a ringer: We wanted to see how the mid-range printers performed in comparision to a high-end 24-pin dot-matrix printer. If you can afford a top-end printer like the 393 or an Epson LQ-2500, buy it.

In the mid-range itself, you cannot beat Epson for supplying quality, performance and features for a reasonable price. Epson sets the standard in more ways than one.

NEC PINWRITER P6 AND P7

THE NEC PINWRITERS were comparatively sluggish in the speed tests. As far as paper handling is concerned, the P6 ($699) and P7 ($995) were not favorites. The Pinwriters are the only printers we looked at that did not come with some sort of built-in tractor-feed



unit, rendering them pretty useless for printing (straight) on continuous-form paper. The cheapest optional tractor for the Pinwriters costs $80.

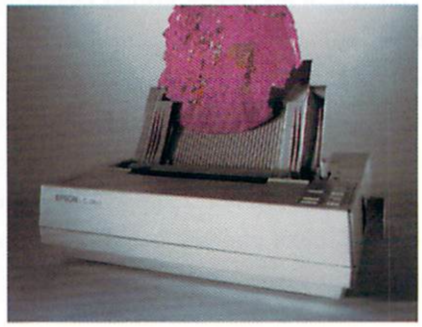
Both Pinwriters have excellent front-panel control over mode, font, and pitch, although the control setup is a little weird. The front panel sports only four buttons. You use one of them to scroll through the print options, which are displayed on an LED in front of the platen.

The Pinwriters offer good quality printing, but are stingy on the extras. Be prepared to pay more for decent paper handling.

EPSON LQ-850 AND LQ-1050

THE EPSON LQ series sets the standard for 24-pin dot-matrix printers—the software standard, that is. All the 24-pin dot-matrix printers we tested are either Epson LQ compatible or offered LQ emulation as an option. As always, Epson printers set a standard of features that other manufacturers feel obliged to meet or surpass in order to compete. We looked at the 10-inch wide Epson LQ-850 ($849) and the 15-inch LQ-1050 ($1199).

We timed the Epson LQ-850 at 122 characters per second (cps) in 10 characters-per-inch (cpi) draft mode and at 64 cps in 12-cpi letter-quality mode. That put it second in



text speed to the more expensive Okidata Microline 393. The Epson matched the Okidata in graphics speed.

You can control the Epson directly through a combination of DIP switches and front panel buttons. The DIP switches control things you should have to set only once; the front panel controls things you will vary more often, such as font and pitch. We like this combination better than other arrangements that eliminate DIP switches entirely. Too many front panel controls can be confusing, rather then convenient. The only complaint we have about the Epson front panel is that it doesn't let you reset the top of form. You still have to turn the printer off and on again to reset top of form.

Epson offers a nice paper-handling feature. Like many other printers, the Epson offers an auto-feed feature; unlike most others, however, it also offers auto eject. When you are using continuous-form paper, you can simply hit the eject button to back the form paper out of the way of the single-

sheet feed. When you're through using single-sheet paper, a touch of a button reloads the continuous form paper, a real time saver.

OKIDATA MICROLINE 393

AT $1399 LIST and 37 pounds, the 15-inch Okidata Microline 393 is a certified heavy-



weight. (Okidata promises a 10-inch model soon.) As far as performance was concerned, the 393 was the best printer we tested, producing draft-quality text at 153 cps and letter quality at 91 cps. Because we used the Okidata 393 with the Epson personality module installed, we were not able to take advantage of some 393-specific features such as triple-height and triple-width printing. The printer worked perfectly, however, with the EpsonQ driver.

The 393 front panel is more extensive than Epson's. We greatly appreciated being able to set top of form with the touch of a button. The controls for setting mode, font, and pitch are also clear and simple to use. The Okidata lets you control many other printer functions from the front panel. Some, such as emphasized or enhanced mode, are normally accessible only from software. Others, such as changing the characteristics of the serial interface, are normally set with DIP switches. You can even program four command macros from the front panel and execute them at any time. If you need such extensive front-panel control, you will love the Okidata Microline 393.

PANASONIC KX-P1524

AT $949, THE Panasonic KX-P1524 has the cheapest list price of any wide-carriage



printer we looked at. In some respects, its price is reflected in its performance. At 98 cps for draft and 43 for letter quality, it was not a stellar performer in our AmigaDOS text file speed printing test. The Panasonic also took twice as long as the Epson and Okidata printers to produce a graphic image.

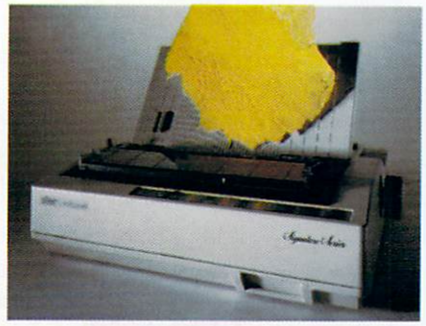
On the plus side, the KX-P1524 is the least expensive widebody. It gives you a lot of printer controls on the front panel, as well as providing DIP switches for seldom-accessed features. One of the front-panel switches lets you set the paper's form length.

Like the Epson LQs, the KX-P1524 offers a very convenient way to switch between continuous-form and single-sheet paper. Hit a button, and the tractor feed retracts the continuous-form paper, letting you use the friction feed for single-sheet paper. The next time you want continuous-form paper, tug the paper bail to reload it from the tractor.

The KX-P1524 is a good deal if you need a wide-carriage printer. If you can get by with a narrow carriage, you will find better quality for less.

STAR NB24-10 AND NB24-15

STAR-MICRONICS has been making less-expensive Epson compatibles about as long as



Epson has been making printers. The NB24-10 ($749) and NB24-15 ($999) are no exception. Both printers offer good text quality (a definite improvement over Star's old Gemini 10s) and reasonable speed. Only the graphics output is not up to snuff. Although the speed is decent, the quality was not quite as high as with the other printers.

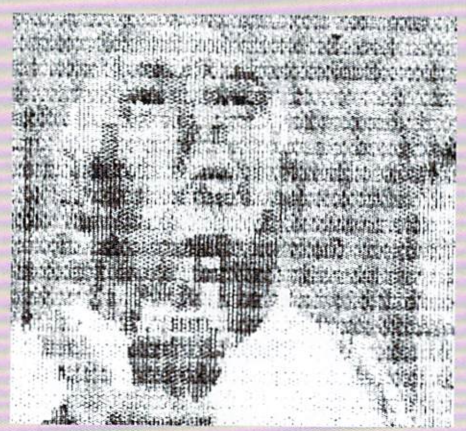
In our opinion, the NB24s have the best front-panel control. While not as high-tech looking as the NECs', it has everything we want in a front panel including a two-button combination to set top of form. One feature of particular interest to Amiga owners is the ability to block software commands. Since most Amiga software resets the printer to default mode before sending other codes and data, this control-lock feature lets you preset print functions that are not supported by your software.

If you don't need very high-quality graphics output, the NB24s are a good choice. The front panel controls make them especially attractive. ►

PRINTER SPECIFICATIONS: 24-PIN DOT

Printer	Epson LQ-850	NEC Pinwriter P7	Okidata Microline 393	Panasonic KX-P1524	Star NB 24-10
Manufacturer	Epson America Inc. 2780 Lomita Blvd. Torrance, CA 90505 800/421-5426 213/539-9140	NEC Information Systems Inc. 1414 Massachusetts Ave. Boxborough, MA 01719 800/343-4418 617/264-8635	Okidata 532 Fellowship Rd. Mount Laurel, NJ 08054 609/235-2600	Panasonic Industrial Co. 2 Panasonic Way Secaucus, NJ 07094 800/PIC-8086 201/348-7000	Star Micronics America Inc. 200 Park Ave. #3510 New York, NY 10166 212/986-6770
Dimensions	17 × 14.2 × 5.6 in.	22.4 × 13.1 × 4.9 in.	22.4 × 16.4 × 7.1 in.	24 × 15.25 × 6.1 in.	15.7 × 14 × 4.3 in.
Weight	19.8 lbs.	25.4 lbs.	37 lbs.	34.8 lbs.	28.2 lbs.
Price	$849	$995 ($1075 with serial port)	$1399	$949	$749
Paper Feeding	Tractor, friction; options: cut-sheet feeder, pull tractor	Friction; options: uni/bidirectional tractor, cut-sheet feeder	Tractor, friction; options: bottom-feed tractor, cut-sheet feeder	Tractor, friction; options: bottom-feed tractor, auto-sheet feeder	Tractor, friction; options: auto-sheet feeder
Type Attributes/ Styles	Emphasized, doublestrike, italics, super/subscript, double width, condensed, double height	Doublestrike, italics, bold, underline, super/subscript, triple/double width, double height, condensed	Emphasized, doublestrike, italics, underline, super/subscript, triple/double width, triple/double height, compressed	Emphasized, doublestrike, italics, underline, super/subscript, compressed, elongated	Emphasized, italic, underline, overline, bold, super/subscript, semi-condensed, condensed, expanded
Pitch	10, 12, 15, proportional	10, 12, 15, 17, 20, proportional	10, 12, 15, 17.1, 18, 20	10, 12, 15, 17, proportional	10, 12, 15, 17, 20, proportional
Line Spacing	1/6, 1/8, n/60, n/180	1/3, 1/4, 1/6, 1/8, n/60, n/180, n/360	1/6, 1/8, n/60, n/180, n/360	1/6, 1/8, n/60, n/180	1/6, 1/8, n/60, n/180
Buffer Size	6K	8K	30K, 32K optional	13.5K, optional expansion to 45.5K	8K, optional expansion cartridge
Typefaces	Roman, draft, Sans Serif, 13 int. char. sets, downloading supported; optional: Courier, Prestige, script, OCR-B	Gothic, Courier, 12 int. char. sets, user-defined character sets; optional: Prestige, Super Focus, bold italic	Courier, 14 int. char. sets, up to 2 downloadable fonts; optional: Prestige, Letter Gothic	Courier, downloading supported, 8 int. char. sets; optional cards: Roman, Prestige, Gothic, Sans Serif, Orator, Script, bold proportional spacing	Prestige, 13 int. char. sets, downloading supported; optional cartridges: Gothic, Orator
Preferences Driver	EpsonQ	EpsonQ	EpsonQ	EpsonQ	EpsonQ
Interface	Centronics parallel, RS-232 serial	Centronics parallel	Centronics parallel, RS-232 serial	Centronics parallel, RS-232 serial	Centronics parallel, RS-232 serial
Ribbon	Fabric cartridge	Fabric cartridge	Fabric cartridge	Fabric cassette	Fabric cartridge

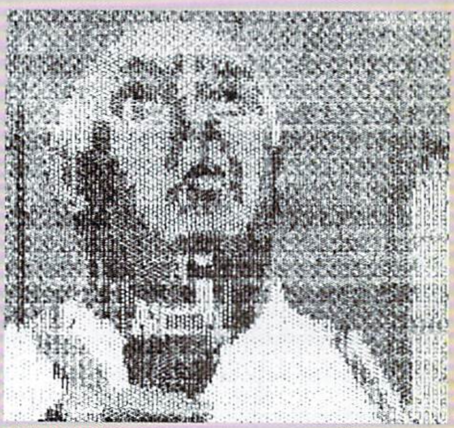
MATRIX



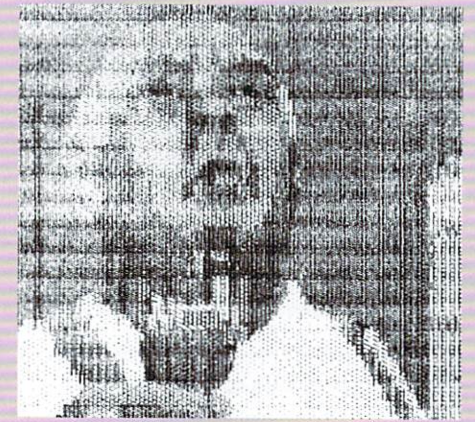
Epson LQ-850



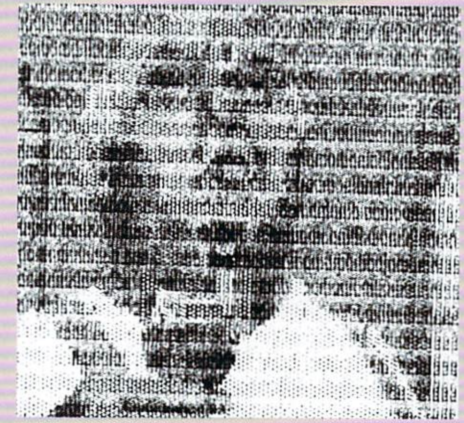
NEC P7



Okidata 393



Panasonic KX-P1524



Star NB24-10

Figure 1. 24-Pin Dot-Matrix Graphics Output. These screen dumps were performed using the EpsonQ driver and with Preferences set to density 1. Note that the dumps will appear darker in the magazine than they actually are.

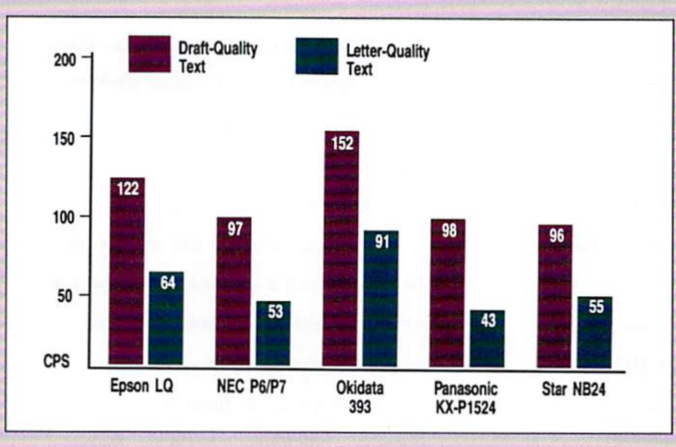


Figure 2. 24-Pin Dot-Matrix Text Speed Test. We created a 10,050-character text file to test the speed of these printers. We set the proper mode and pitch from the front panels of the printers (10 cpi draft and 12 cpi letter-quality) and outputted the test file with the AmigaDOS TYPE command. The results are not absolutes—other software arrangements will yield other results—but rather as a basis to compare the relative speeds of the printers.

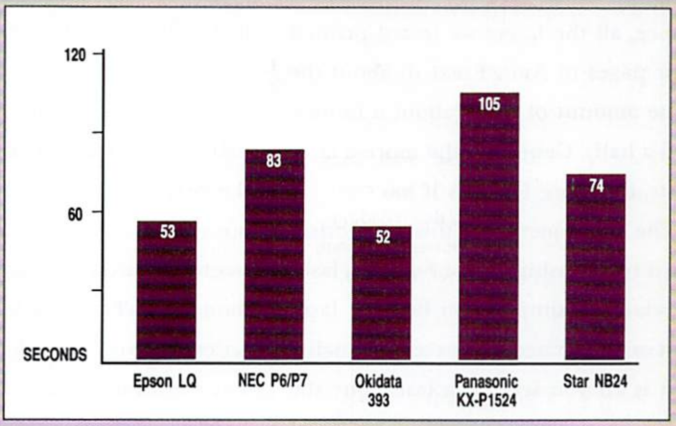


Figure 3. 24-Pin Dot-Matrix Graphics Speed Test. *AmigaWorld* staffer Roger Goode supplied the 640 × 200 graphic for the speed test. We dumped it using the Workbench 1.3 GraphicDump program, with Preferences density set to 1. Once again, note that the speeds are relative. Other software and other pictures will yield different results.

LASER PRINTERS

THE FOUR PRINTERS under review here cannot, strictly speaking, be compared equally because one of them—the QMS-PS 810—supports PostScript output as well as the Hewlett-Packard-emulation mode. Of course, you pay for what you get; the PS 810 costs about $5500, while the others are priced in the $2000–$2600 range. More expensive as a whole than the 24-pin dot-matrix printers reviewed in the previous section, the lasers provide superior printed output in a page-oriented fashion—offering multiple fonts and styles and excellent graphics and text quality.

The information here is comprised of short descriptions of each printer, a specifications chart, a graphics-speed comparison graph, and examples of graphics output. We found that text speeds for all four models were basically equal—approximately 2.6 pages per minute.

FOOTNOTES

WITH LASER PRINTERS, as with just about anything else, you get what you pay for. Unlike the situation with the 24-pin dot-matrix printers, we did not find a laser printer that, like the Epson LQ, offered a serious price/perfromance advantage over its rivals. For instance, all the lasers we tested printed four pages of Amiga text in about the same amount of time (about a minute and a half). Generally, the more a laser costs, the more features it has.

The consequence of this straightforward relationship is that buying a laser is relatively simple: You buy the laser that suits your needs. If excellent quality text is all you seek in a laser, buy the Laserline 6. If you want quality text plus full-page graphics, get the Ricoh. For full-page graphics plus more fonts and options than you ever thought possible, get the HP LaserJet. Finally, if you want the utmost control over the printed page and you have PostScript-compatible software, you need something like the Laser Connections QMS-PS 810.

Lasers have become much easier to maintain and use since HP introduced the original LaserJet. Toner cartridges are effortless to install and replace; paper feeds hardly ever jam. If you have the money, don't hesitate to get a laser over an expensive 24-pin dot-matrix printer. The eardrums you save may be your own.

HEWLETT-PACKARD LASERJET SERIES II

THE HEWLETT-PACKARD LaserJet Series II ($2595) sets the standard for non-PostScript laser printers. The printer comes with 512K of RAM, but can be expanded by one, two, or four megabytes. The LaserJet driver in Workbench 1.3 gives you full



control over output density, from 75 dpi to 300 dpi.

The output speed of the HP LaserJet is even more impressive, with a 320×200 five-bitplane image printing in under 20 seconds. Text rolls off the drum at 2.6 pages per minute.

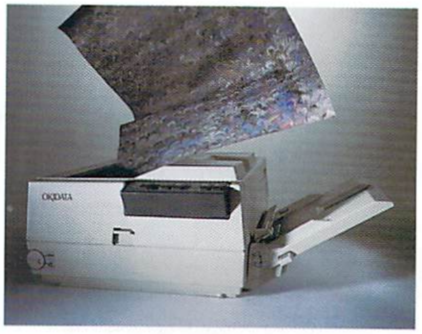
You receive only one set of fonts—Courier—although the two front slots allow for easy installation of the optional cartridge fonts. To save money, you can download additional fonts from your Amiga.

The front control panel has membrane-style buttons and a one-line LCD display for control information and error messages. From the control panel, you can select the font type, font source, page length, and the number of copies to print. On the rear of the printer are the parallel, serial, and optional I/O interfaces.

We found the HP very easy to use and compatible with nearly all Amiga software. If you do not need PostScript support, the HP LaserJet is hard to beat.

OKIDATA LASERLINE 6

AS YOU WOULD expect from the lowest-priced laser tested, the Laserline 6 ($2145) does not have all the features of higher-priced models. Don't let that turn you off, however; the Laserline 6 is a great way to break into laser printing, especially when you purchase its optional HP LaserJet-emulation module and consider that you can use



all HP LaserJet font cartridges with it.

Like all lasers, the Laserline 6 offers near-typeset text and graphics. In its base configuration, however, the Laserline does not have enough memory to print a complete Amiga screen at its best output density. In fact, its memory is not sufficient to output a full screen at the second-best density, cropping one-half inch off the bottom of the image. You can expand the memory of the Laserline 6 to 512K, allowing you to print an Amiga screen at 300 dots per inch, but even this extra RAM will not let you print an entire page of graphics.

Another shortcoming of the Laserline 6 is its front panel. You cannot control manually such print variables as font and density. Everything is under software control.

Despite its shortcomings, we like the Laserline 6. Its text and graphics output are superb. If you don't need a laser printer to output a full page of high-density, the Laserline 6 is a great value.

QMS-PS 810

IF YOU LIKE having plenty of choices, you will like the QMS-PS 810 ($5495). A multipurpose laser printer, the PS 810 supports HP-emulation mode as well as PostScript output. In addition, it can emulate a Diablo printer and a Hewlett-Packard GL Plotter. For interfaces, you can choose from parallel, serial, and Appletalk 9 pin.

Alternating among modes and interfaces,



however, is inconvenient at best. The push-button switch is located in the lower back of the printer, an annoying position for the most important control on the printer. You must either set up the printer so you can access the rear, or move the 42-pound machine whenever you want to change modes.

The brains of the QMS 810, the fonts and printer emulations, are in the personality module, a small circuit board that installs internally. With the manual's straightforward instructions, installation is fairly simple. Adding extra memory is as simple as a trip to your local dealer. The PS 810 comes with two megabytes of RAM, but a registered dealer can install a third internally.

Instead of a control panel, the QMS-PS 810 has four symbols with lights to indicate the current status of the printer. All control information (outside of emulation mode) must be sent to the printer from the Amiga.

Testing it in HP-emulation mode, we found the PS 810 worked as well as the HP LaserJet Series II with all software we tried. For PostScript, the printer functioned as expected, with very impressive results. The QMS-PS 810 proves you can have your PostScript and HP too.

RICOH PC LASER 6000

DON'T LET THE name fool you—the PC Laser 6000 ($2495) will work just fine with



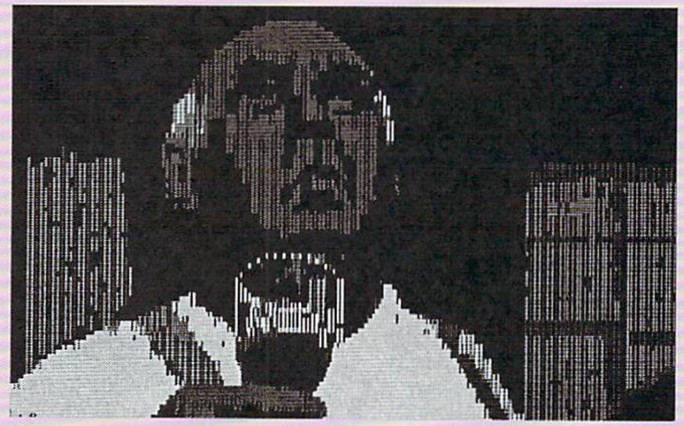
your Amiga. A step up from the Laserline 6, the PC Laser 6000 contains one megabyte of memory and can output an entire page of Amiga graphics at 300 dpi. Of course, you can only print graphics if you also buy the HP LaserJet-emulation card. In default mode, the PC Laser 6000 emulates the lowly Diablo 630.

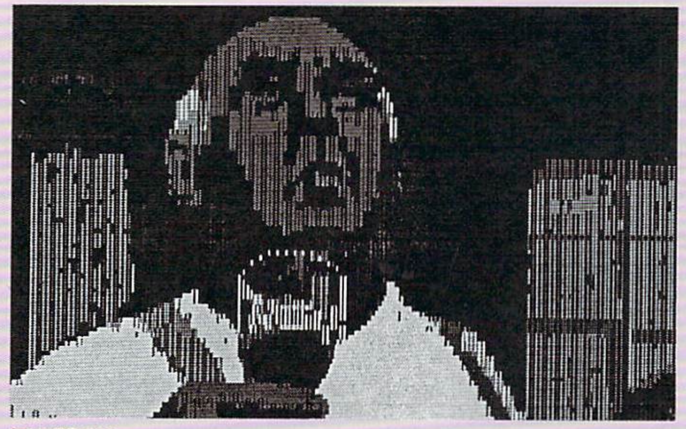
The front panel of the PC Laser 6000 is also an improvement over the Laserline. It lets you control manually many more print options, including font selection. If your software does not let you select fonts, you can use the front panel to use a font other than the default. One catch is that using the front panel is not as easy as it could be because of cryptic icons and the convoluted menu access.

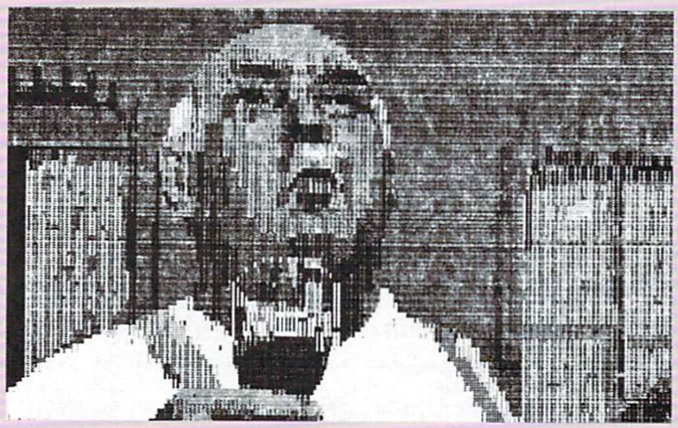
If you need the ability to print an entire page of graphics, the Ricoh, with its one megabyte of memory and optional 512K cartridge, is a great choice. Although it does not offer all the text options of the HP LaserJet Series II, its text quality is excellent. ►

PRINTER SPECIFICATIONS: LASERS

Printer	Hewlett-Packard LaserJet Series II	Laser Connection QMS-PS 810	Okidata Laserline 6	Ricoh PC Laser 6000
Manufacturer	Hewlett-Packard 19310 Pruneridge Ave. Cupertino, CA 95014 800/367-4772	The Laser Connection PO Box 850296 Mobile, AL 36685 205/633-7223	Okidata 532 Fellowship Rd. Mount Laurel, NJ 08054 800/654-3282 609/235-2600	Ricoh Corp. Peripheral Products Division 3001 Orchard Parkway San Jose, CA 95134 408/432-8800
Price	$2595	$5495	$2145	$2495
Dimensions	18 × 19 × 8.5 in.	18 × 18.5 × 9.1 in.	16.1 × 16.5 × 9 in.	16.1 × 16.5 × 8.1 in.
Weight	50 lbs.	41.9 lbs.	37.8 lbs.	37.5 lbs.
Type Attributes	Bold, compressed, underline	Bold, italic, underline	Bold, italic, compressed, underline	Bold, underline, compressed
Pitch	10, 16.66	Software defined	8, 10, 12	10, 12, 15, font defined
Lines Per Inch	1, 2, 3, 4, 6, 8, 12, 16, 24, 48	Software defined	1, 2, 3, 4, 6, 8, 12, 16, 24, 48	3, 6, 8, font defined
Buffer Size	512K, optional expansion modules	2MB, optional expansion modules	113K page, 128K print, optional expansion modules	1MB, optional expansion modules
Typefaces	Courier, Lineprinter, 19 int. char. sets, 23 optional font cartridges	Courier, Times, Helvetica, Helvetica-Narrow, Avant Garde-Book, Avant Garde-Demi, Bookman-Demi, Bookman-Light, New Century Schoolbook, Palatino, Zapf Chancery Medium Italic, Symbol Set, Zapf Dingbats	Courier, Times, Lineprinter, Helvetica, 7 int. char. sets, optional fonts, supports downloadable fonts	Century, Courier, Prestige Elite, Letter Gothic, 15 int. char. sets, optional fonts
Preferences Driver	HP LaserJet	Diablo 630, HP LaserJet	HP LaserJet	Diablo 630 standard, HP LaserJet emulation
Emulations	HP	HP, PostScript	HP	HP
Engine	Canon	Canon	Ricoh	Ricoh
Interface	Centronics parallel, RS-232 serial	Appletalk, Centronics parallel, RS-232 serial	Centronics parallel, RS-232 serial	Centronics parallel, RS-232 serial


HP LaserJet


QMS-PS 810


Okidata Laserline 6

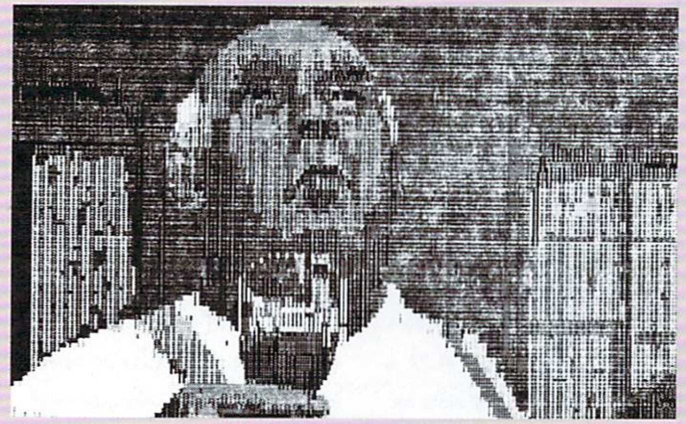

Ricoh PC Laser 6000

Figure 4. Laser Printer Graphics Output. These pictures were produced using the HP LaserJet driver and a Preferences density of 4. Once again, the pictures as reproduced here appear darker than they actually are.

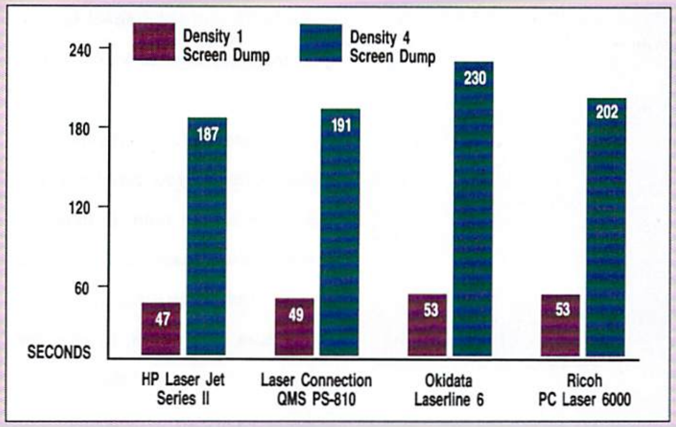


Figure 5. Laser Graphics Speed Test. The lasers printed text at nearly identical speeds, but graphics-printing speeds were more varied. We dumped the screen with GraphicDump using density 1 and density 4 from Preferences. To dump density 4 graphics to the Laserline 6, we installed the optional memory module. We did not time a PostScript bitmap dump with the QMS-PS 810 (we didn't have the patience).

DOTS ENOUGH

AS IN MOST aspects of life, with printing graphics, absolute resolution is not the final word. To wring the most from your printer, you need a thorough understanding of its capabilities and how they relate to the Amiga's display modes and Preferences.

Most popular nine-pin dot-matrix printers have horizontal resolutions of 60, 120, and 240 dots per inch (dpi). Preferences supports a vertical resolution of 72 dpi based on the pin spacing of the printhead. The Amiga's screen display, without overscan, ranges in size from 320 horizontal by 200 vertical pixels up to 640×400 pixels. At 120 dpi, a nine-pin printer can place 960 dots across an eight-inch page. At 72 dpi, it can print up to 792 dots on an 11-inch sheet. For black-and-white screens, the dot combination is more than adequate to produce a pixel-for-dot dump of any size Amiga screen.

A gray-scale dump uses a four-by-four dot matrix to translate the screen colors into 16 shades of gray. Using this square matrix reduces the printer's resolution to 30 dpi horizontally and 18 dpi vertically. For an 8×11-inch page, the total comes to 240×198 gray-scale pixels, which is insufficient to accurately reproduce even the lowest resolution Amiga screen. Even the 300 dpi resolution of a laser printer is not good enough to generate the 2560 horizontal dots needed to resolve a 640-pixel image as a gray-scale dump. Because most images have large areas of uniform color, you can work around the resolution and create an acceptable 8×11-inch printout despite the loss of detail.

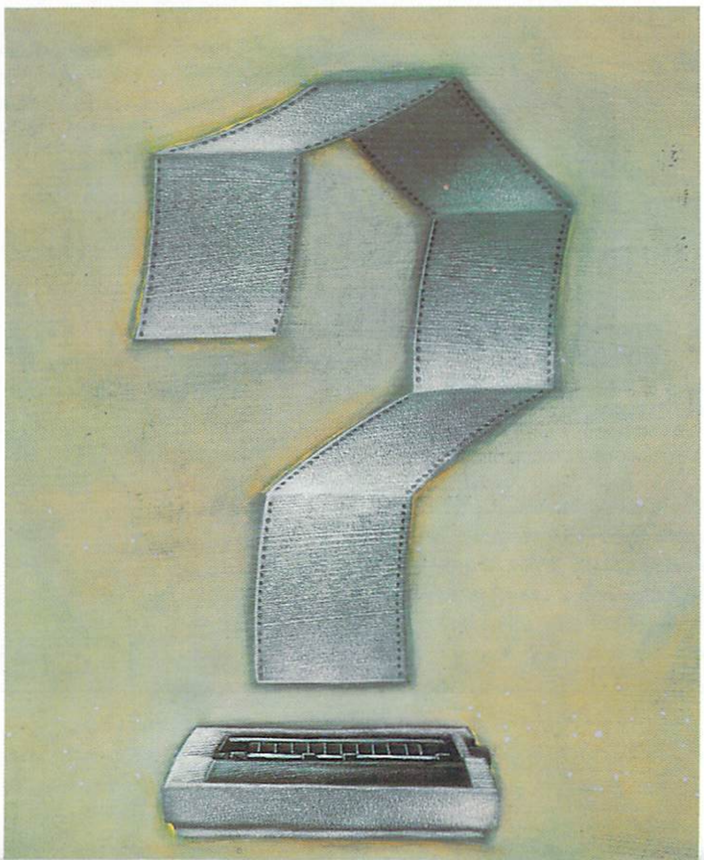
Color printers have a similar problem representing all 4096 colors of the Amiga's palette with a four-by-four matrix and three ink colors. Under these restrictions, even the 180×180 dpi resolution of the Hewlett-Packard PaintJet printer drops to only 45 dpi. With a basic resolution of 83×83 and a printed line of less than eight inches, the Canon PJ-1080A has a net resolving power of less than 21 dpi. To reproduce every single pixel of the on-screen image, you must increase the size of the printed image. A quick calculation shows that a 640-pixel wide Amiga screen corresponds to a 31-inch wide color page on the Canon PJ-1080A, without any duplication of screen pixels. As a result, the enlarged graphics look fine when viewed from a short distance.

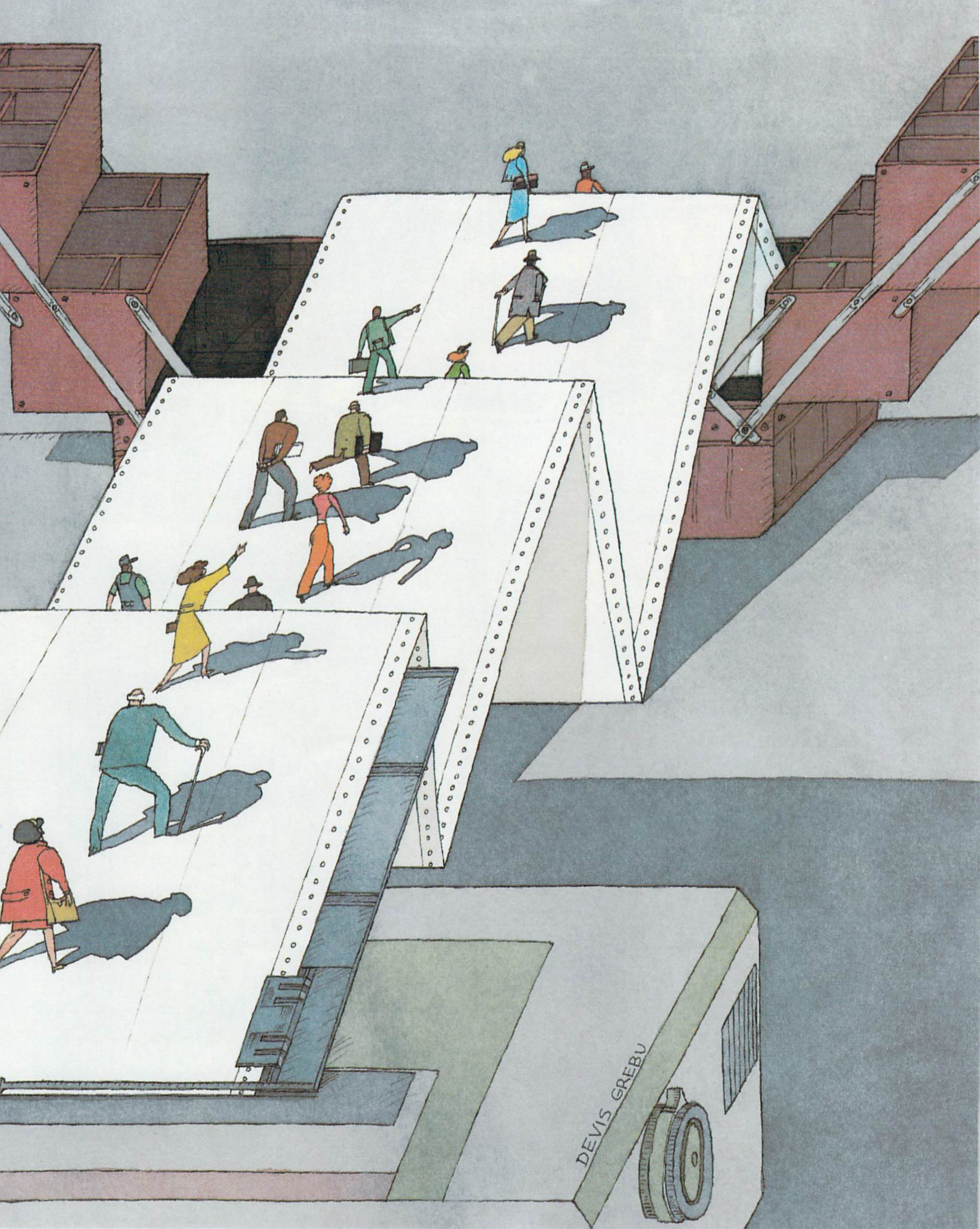
For a perfect printed image, you should match the aspect ratio of the printed image and the original screen image. The ratio of the width to the height of the entire image less the screen borders should be approximately 1.3. The Amiga's printer driver will generate automatically an image with the proper aspect ratio by duplicating some (but not all) of the pixel rows or columns as required. The resulting image sacrifices pixel accuracy to maintain the proper proportions. With Preferences 1.3 you can specify the vertical and horizontal printer scaling factors to generate the proper proportions *and* retain pixel accuracy. The formula for calculating the scaling factors is:

$$H/V = Ar \times (Pv \times Vdpi) \div (Ph \times Hdpi)$$

H = horizontal scaling factor
V = vertical scaling factor
Ar = aspect ratio [1.3]
Pv = no. of vertical screen pixels [400]
Vdpi = printer vertical dpi [3]
Ph = number of horizontal screen pixels [640]
Hdpi = printer horizontal dpi [83]

The bracketed values are for an example using the Canon PJ-1080A and a 640×400 pixel screen image. The ratio of H to V is 0.8125, or approximately 4 to 5. If you use a nine-pin dot-matrix printer with Vdpi equal to 72 and Hdpi equal to 120, then the ratio of H to V is 0.4875, or approximately 1 to 2. For overscan images and non-standard screen formats, you may have to adjust the aspect ratio. In most cases, you will have to use a mural printer, such as HUGEprint or The Big Picture (see p. 40), to print the oversized image. In Preferences' Graphic 2 screen, set Scaling to Integer, set the Limits to Multiply, and enter the calculated vertical and horizontal scale factors in the Width Limit and Height Limit gadgets. From here your printing program takes over. —*Morton Kevelson*




DEVIS GREBU

SPECIAL PRINTER REPORT-2

PRINTER TOOLKIT

We're taking a trip to the toolshed (no, not the one where you went for the proverbial "whupping" back in Grandfather's day). Instead, you'll find a handy toolkit of printer utilities there to help you with your special printing jobs.

BY MORTON A. KEVELSON AND LOUIS R. WALLACE

IF YOU'VE BEEN able to get your hands on a copy of the new version 1.3 of the Amiga's operating system, you were probably impressed with the vastly enhanced printer support it offers. Yet, even with the dramatic increase in custom printer drivers now available to the Amiga, there will always be numerous specialized applications for which the standard equipment just won't do. That's why the following trip to our toolshed of printer utilities is a must visit.

Whether your printer is dot matrix or laser, whether you need screen dumps, window printouts, segmented blowups or detailed reductions, sideways-style spreadsheet printouts, high-resolution printed output from a CAD program, or whatever, the utilities outlined here should help you get the job done.

DOT-MATRIX PRINTER UTILITIES

The ability to print the current contents of your screen is a useful, and often necessary option. Although the Amiga's multitasking capabilities let you open up as many windows as needed to preserve the output from a variety of tasks, the actual display is still limited to approximately 2000 text characters at one time. AmigaDOS' DIR > PRT: command will redirect text output to the printer, as in the case where you wish to send a listing of the current directory to the printer. AmigaDOS, ►

ILLUSTRATED BY DEVIS GREBU

however, has no built-in means of getting what is on the screen to the printer once it is on display. This is where screen dumpers come into play.

Screen Dumper Utilities

Your choices run the gamut from a limited utility on your Workbench disk, to public-domain/shareware offerings, and finally commercial-quality utility programs. (For a description of two shareware screen dumpers, see the accompanying sidebar "Public Dumping Permitted.")

The System drawer on your Workbench 1.2 disk contains a screen-dumper utility. To use it, either double click its icon on the Workbench screen or invoke it from the CLI. Once GraphicDump is initiated, you have approximately ten seconds to move things around, such as by clicking on front-to-back gadgets, manipulating the sizing gadgets and drag bars, and so forth, until the screen is organized to your satisfaction. Needless to say, this is not the best way to get a screen dump, but in many situations it can get the job done.

Among the commercial offerings is Discovery Software's Grabbit. Unlike many screen dumpers, it lurks in the background until activated by the appropriate hot-key combination. Grabbit will then take the front screen, place it into a RAM buffer, and send it to the printer according to the current settings in Preferences. Because it runs in the background, you can continue using your Amiga for other tasks during printing. If there is not enough free memory in which to set up a buffer, Grabbit will lock the front screen until the printout is complete. A second hot-key sequence lets you save the front screen to disk in the form of a compressed IFF-image file. The Grabbit disk contains AnyTime, another HotKey-driven utility, which will bring up a color palette with the appropriate number of colors for the current screen. You can then adjust the screen colors for improved viewing or for subsequent processing with Grabbit.

Although not really a screen dumper, Meridian Software's Zing!Keys contains a screen dumper among its myriad functions. The bulk of the program is a collection of keyboard macros and hot keys, with a facility for designing your own macros and hot-key functions. But at $49.95, it does offer two utilities of interest: ZPDUMP, which sends the current screen to the printer, and ZSAVEIFF, which sends it to the disk as an IFF-image file. You can scale your printer dumps at 33⅓%, 50%, or 100% of full size.

Computer Toolsmith's WindowPrint II differs from the other screen dumpers because it does not limit its attention to an entire screen. Instead, it lets you work with the contents of individual windows and portions of windows, as well as with the entire screen. WindowPrint provides you with complete dimensional control of your printouts; you can set them to fill automatically the entire width of the page or restrict them to pixel-for-pixel representation of the screen. You can adjust the height and the width of the dump independently, from 0 to 200 percent of the screen size. WindowPrint II will also save selected windows to an IFF file for subsequent processing. There are also several useful supplementary utilities, including Snatch, which saves the current screen to disk when triggered by a hot-key sequence, and IFF-Icon, which lets you create Workbench program icons from IFF-image files.

Mural Makers

Under normal circumstances, the size of a printer graphic dump is limited to the width of the printer. But if you want a larger printout, it is possible to break up an image into a series of expanded image segments from within a paint program. DeluxePaint II, for example, allows you to "stretch" and then divide into such segments. The process, however, tends to be tedious and time-consuming. Fortunately, there is an easier way, as the following programs will demonstrate. These utilities let you blow up an image printout over several sheets for subsequent paste up.

HUGEPrint, by Hugh Crawford of Hugh's Software Ranch, allows you to partition an image in up to 16 strips. You set the width of each strip in Preferences, which also controls the characteristics of the printout. The total width of all the strips can be up to eight-and-one-half feet. Strips can be printed individually in the event a section of the mural is damaged and has to be replaced, or if the printer fails to complete the operation for some reason. You can also set the aspect ratio to generate either square pixels or video-proportioned pixels. (See the sidebar "Dots Enough" in the article "Lasting Impressions" in this issue for a specific application that uses HUGEPrint.)

Lightning Publishing's The Big Picture is a collection of 15 versions of itself—each of which is for a different printer. To set the size of the printout, specify the number of pixels in each direction, up to 9999 of them horizontally and vertically. The program determines automatically the number of strips required for the mural. The height and width values can be set independently. A height of zero results in a screen-proportioned print. The Big Picture does not display the image being printed; instead, the image data is pulled directly from the disk, processed, and sent to the printer. To avoid tying up a disk drive for what may very well be a lengthy printing task, it is a good idea to transfer the image to RAM: before using The Big Picture. Because the program does not use Preferences, it will not benefit from the new features in version 1.3. As a direct consequence, we found that only color murals could be made on our Canon PJ1080A. The Big Picture's working window contains gadgets for entering the size parameters, a file name, and the number of copies. Although the program was able to multitask, it tended to tie up the printer port even when it was not printing. We were also unable to close The Big Picture until it had the chance to actually print something.

There are several full-featured graphics packages

that also provide facilities for generating mural-size printouts. Because these are actually graphics programs rather than printer utilities, we will only make mention of them here. Consult the manufacturers directly (see the "Product Information" box) for further information about PAR Software's Express Paint 2.0, Electronic Arts' DeluxePrint II, and Unison World's Print Master Plus.

Designlab's Fine Print is an unusual program providing a use for one of the by-products of microcomputing—the well-worn printer ribbon. Although it was not ready in time for this roundup, we did see a preliminary version in action at AmiExpo in New York. Fine Print generates highly-detailed gray-scale graphics dumps of Amiga images by overstriking each dot as many as 15 times. The overstriking requires the use of the worn ribbons, as fresh ribbons will produce a solid black image. Because many nine-pin dot-matrix printers have resolutions as high as 240 dots per inch, it is possible to make fully-detailed, postage-stamp-sized printouts using a low-cost impact printer. (A Fine Print image will, of course, take some time to print.) Fine Print falls in our "Mural Makers" category, as it will print images over 100 feet tall. So start saving those old printer ribbons—there may be a use for them yet.

Odds and Ends

The remaining printer-support utilities are very specialized and thus fall into this final "miscellaneous" category.

For some reason, the width of a spreadsheet always manages to exceed its height, usually by substantial amounts. The traditional solution is to print out the spreadsheet in chunks and then cut and paste the pieces into the proper order. Micro-Systems Software's Flipside!, a sideways-style printing program, provides an alternative to this time-consuming process and is now available on the Amiga. All you need is a spreadsheet program that can save its data to disk as an ASCII file. Flipside! reads in the data from the disk file and, by using your dot-matrix printer's graphics capabilities, prints out the text sideways.

Hi-Tech Graphics' Plot-to-Print is intended for use with Aegis Draw or Draw Plus, MCAD, and Dynamic-CAD. CAD programs generally use plotters to obtain the detail required for engineering drawings. The resolution of a typical plotter exceeds 1000 dots per inch. Because plotters are expensive as compared to dot-matrix printers, very few users can justify their cost. Popular and relatively inexpensive CAD packages like the ones mentioned above support dot-matrix printers. Unfortunately, the dot-matrix printer support consists of no more than a bitmap-graphics dump of the image currently displayed—not a very satisfactory solution.

Plot-to-Print lets you utilize the full resolution of your dot-matrix printer with your CAD program. For Epson-compatible printers, the resolution can range from 60 horizontal by 72 vertical dots per inch to as many as 240 horizontal by 216 vertical dots per inch. To use Plot-to-Print, you must first persuade your CAD program to save its output as a disk file in the Hewlett-Packard Graphics Language (HPGL). Once the data is in HPGL format, you use one of the Plot-to-Print utility programs to convert the HPGL file to ►

Public Dumping Permitted

THERE ARE A number of useful, and of course much less expensive, screen dumper utilities in the public domain or available as shareware (where you pay a voluntary donation to the author if you find the program of use to you). Several utilities contained in the Amicus public-domain collection of disks are shareware screen-dumper programs. Amicus disk number 8 contains three such programs, including Ned Konz' ScreenDump 1.1. When activated, ScreenDump opens at the bottom of the screen a window whose height is only that of a menu bar. When the screen you wish to print is on the display, simply click on the menu bar to send it on to the printer. The hardcopy format is controlled from Preferences.

Brian Conrad's SHOWPRINT II.3, contained on Amicus disk number 22, is not, strictly speaking, a screen dumper. It is designed to load and display any IFF-image file and send it to the printer. It offers you complete control of the size, aspect, aspect ratio, and mode of the printout from within the program. Because it runs in the background, both the program and the displayed image can be placed out of sight once the dump is started. SHOWPRINT supports overscan mode for images larger than the display screen. The program is menu-driven and easy to use. Additional documentation and a tip sheet will be provided to registered users.

ScreenDump 1.1
Ned Konz
210 Oleeta Street
Ormond Beach, FL 32074
904/756-2983
$10

SHOWPRINT II.3
DataWise Technologies
PO Box 62
Touchet, WA 99360
$5

MK

a series of bitmaps on disk scaled to your specifications. Finally, using another Plot-to-Print utility program, dump these bitmaps to a printer. Although the package is a bit cumbersome, it does get the job done and the results are impressive. Hi-Tech Graphics is presently working on a more user-friendly version of the program. Plot-to-Print currently supports several printers, including the Epson nine-pin and compatibles, the Epson 24-pin, the Toshiba 24-pin, the NEC 24-pin, and the Canon PJ-1080A.

LASER PRINTER UTILITIES

As you undoubtedly know if you already have one, a laser printer is an expensive acquisition. Yes, they *are* sophisticated printing powerhouses, but yes too, you want to get the most out of them for the least additional cost. Many software packages ideally suited to laser printers—such as desktop-publishing programs—are, unfortunately, also fairly expensive. But here's some good news for laser owners: There is inexpensive software that really does help you utilize your laser printer to its full capabilities—printer utility programs.

TRAVELING WITH THE "JET SET"

The laser printers most often used on personal computer are the HP LaserJet series (and their numerous clones). Unfortunately, the HP is not a PostScript printer, meaning it does not have the special command language most often used for desktop publishing. Yet it does have its own commands, and, with careful planning, you can use them to create very impressive professional quality documents. (See the article "Lasting Impressions," in this issue for a more detailed description of the HP LaserJet printer.) To make this task easier, C Ltd has developed the Jet Set laser-printer utilities.

Jet Set provides you with an easy-to-use CLI-based interface for issuing commands to control the HP printer. With it you can download fonts to the printer, control the placement and appearance of your text, and even create many types of forms. The commands can be executed directly from the keyboard or from within a text file created by any text editor or word processor that allows you to save ASCII files.

The command set is quite extensive, with over 90 different commands available. These range from margin and page controls, to more standard printer commands like form and line feeds. There are commands to draw boxes, lines, and rules of various sizes and shades. You can also use Jet Set to download fonts to the HP, and select them from within your document. You can position the cursor anywhere on the page at any time from within your document itself. Other features include mode-selection for switching between the various dot densities the printer can generate, and the ability to change from portrait (normal) printed output to landscape (rotated) output.

Another advantage to Jet Set will be apparent to users of Scribble! and Textcraft. By combining Jet Set commands with the documents generated by these widely used word processors, you can take advantage of the high-quality fonts that can be downloaded to your HP laser printer.

POSTSCRIPT UTILITIES FROM THE "STUDIO"

If you do have a PostScript-based laser printer, such as the Apple LaserWriter or the QMS-PS 810, you might wonder why you would need or want laser utilities, seeing that your printer already has commands for formatting. In this case, the utility software makes it easier to access the PostScript features from within your documents, again without the expenses of a PostScript-based page-layout program.

Scott Anthony Studios has three different PostScript laser-utility programs. The first, LaserUtilities, Vol 1.2, is in many ways similar to Jet Set, as it allows you to turn your word-processing or ASCII text-editor files into a highly polished printed document by including embedded PostScript control commands within the document. These are easy-to-use, two-digit commands—such as /FS nn def (which defines a font-scale of size nn). Others are margin- and page-control commands that simplify the designand layout process. Text can be centered and boxed automatically, using various sizes of fonts and lines, with boxes filled with varying levels of gray shades. You can create circles and ellipses, and place bullets anywhere in the text in either plain- or filled-circle format, or as stars of varied size.

A second S. Anthony Studios PostScript utility, LaserUp! Print1.2, is a useful picture-printing program that can take any IFF-compatible bitmap image and print it on a PostScript page. The program is entirely menu- and mouse-driven, and it allows you to scale and position the image any way you wish on the page. A very simple pixel editor is included for fine detail "brush ups" of the picture. You can select any rectangular region of the image by placing a box around it and print only that region. You can wrap the image in any of a large number of border styles (included) and convert it to any of several different halftone types. You can add text to the picture if you wish.

Once defined, the picture can be printed to the PostScript printer in up to 48 shades of gray or saved as an ASCII text file that can be used with other PostScript packages, even on other computers. Finally, LaserUp! Print1.2 offers the ability to perform a four-color separation of the graphic image, printing or saving the separations as desired. The only draw-

PRODUCT INFORMATION

DOT-MATRIX PRINTER UTILITIES

The Big Picture
Lightning Publishing Consultants
1821 N. Ohio St.
Arlington, VA 22205
703/534-8030
$29.95
No special requirements

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512K required

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Elevator Way, Terminal #2
Vancouver, WA 98666
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Designlab
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Owego, NY 13827
607/687-5740
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Micro-Systems Software distributed by Brown-Wagh Publishing
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Los Gatos, CA 95030
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408/395-3838
$59.95
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Discovery Software International
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Annapolis, MD 21401
301/268-9877
$29.95
No special requirements

HUGEPrint
Hugh's Software Ranch
232 East 8th Street #1B
New York, NY 10009
212/353-2465
$49.95
No special requirements

Plot-to-Print
Hi-Tech Graphics
PO Box 446
Tallmadge, OH 44278
Canon $20
Epson 9-pin $25
24-pin $35
No special requirements

Print Master Plus
Unison World
2150 Shattuck Ave., Suite 902
Berkeley, CA 94704
415/848-6670
$49.95
512K required

WindowPrint II
Computer Toolsmith distributed by T & L Products
2645 Wilson St.
Carlsbad, CA 92008
619/729-4020
$34.95
No special requirements

Zing!Keys
Meridian Software Inc.
PO Box 890408
Houston, TX 77289-0408
713/488-2144
$49.95
No special requirements

LASER PRINTER UTILITIES

Jet Set
C Ltd
723 East Skinner
Wichita, KS 67211
316/267-3807
$39.95

LaserUp! Plot ($49.95)
LaserUp! Print 1.2 ($89.95)
LaserUtilities ($39.95)
Scott Anthony Studios
889 De Haro St.
San Francisco, CA 94107
415/826-6193
No special requirements

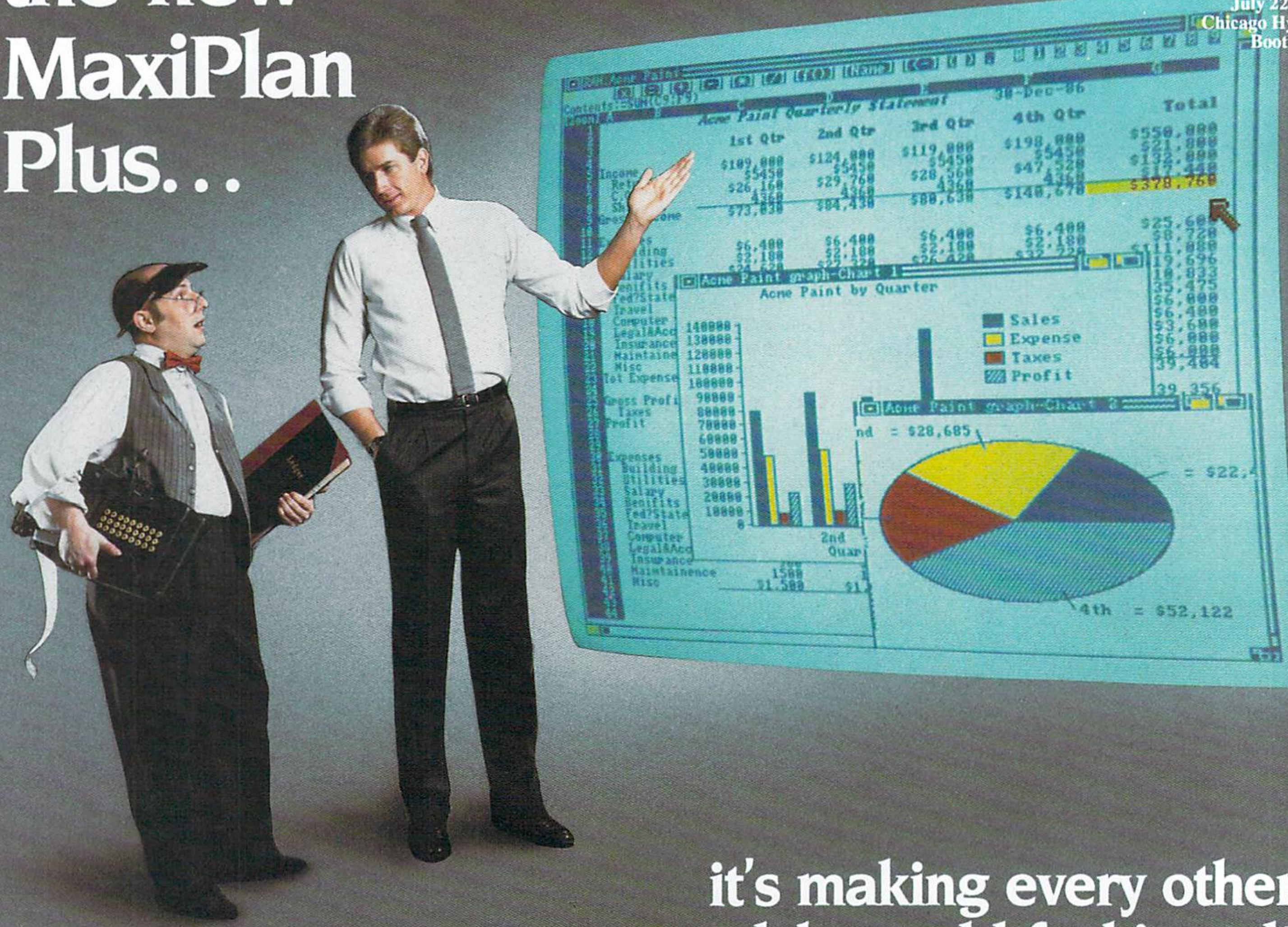
back I found to Print1.2 is that it requires the printer to be interfaced to the Amiga via the serial port. All other S. Anthony Studios packages work on whatever is defined as the PRT: device.

The last of the S. Anthony utilities is a very specialized package, LaserUp! Plot, which converts CAD files created with Aegis Draw or Draw Plus from their vector-based object files to PostScript-described files. Once converted they can be quickly printed on your laser printer at the highest density available (300 dots per inch). Most importantly, they can be included in other documents, where they can be resized and positioned as needed, just like any other PostScript defined image. ■

Morton A. Kevelson is a frequent reviewer and Louis R. Wallace is a contributing editor for AmigaWorld. *Write to Morton at 2471 Bragg St., Brooklyn, NY 11235. Write to Louis c/o* AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

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THREE FOR THE LOAD

By David T. McClellan

LIKE A GOOD TRUCK, a programming language should be dependable over the long haul, but be able to pour on the speed when you are behind schedule. Modula-2 is a souped up version of Pascal with most of its problems removed, and was pioneered by the same man, Niklaus Wirth. The module concept cleans up most of the breakdowns (such as automatic variable type casting) in C that sent me to the debugger too often and is somewhat cleaner than object libraries, because the modules are version-controlled. Modula-2 is much pickier about data types than C, but it does allow open arrays (arrays whose exact sizes are not known) as procedure parameters, correcting one of Pascal's great flaws. It also allows coercion of data and pointer types.

Each of the three Amiga compilers, TDI Modula-2 version 3.01a, M2Amiga version 3.1, and Benchmark Modula-2 version 1.03, has its own editor, integrated to differing extents, and its own linker. All three feature modules defined for the Amiga libraries and routines, as well as the standard Modula-2 modules such as InOut and SYSTEM. For all three you can get by with a 512K machine, although I recommend having at least a megabyte and at least two floppies, but preferably a hard disk. The differences shine through in the quality of the AmigaDOS and kernel interfaces, the generated code, and their documention.

TDI

The first commercial Modula-2 compiler for the Amiga, TDI comes in three versions: basic, developers, and commercial. Besides the difference in price, the developers and commercial versions offer source code for various modules, IFF (Interchange File Format) and ILBM (Inter-Leaved Bit Map) support, a disassembler, and a cross-referencer. All three use the original four-pass Wirth compiler model as a basis, which slows them down a bit. TDI offers several compiler switches, such as $OPT+ or $OPT−, for code optimization, but you must imbed them in the code. This style of comment-set options goes back to the first CDC Pascal compiler, at least. M2Amiga and Benchmark Modula-2 allow similar compiler switches, but also provide command-line versions.

The integrated editor is supposed to find error files produced by the compiler, .erm files, then count and mark the errors in the source code. It works about half of the time and is often unable to identify the problems in an error file produced by the compiler. To be convinced you have found all the bugs, you are almost forced to use the editor to step through the code line by line. The .erm files are text files, listing the line and the error number, so you can use another editor to speed things up. After struggling with TDI's editor, I reverted to examining and editing files with MicroEmacs. The TDI editor is far inferior to MicroEmacs and is really only useful for tracking errors you have already identified. For more serious compilations, the symbolic debugger lets you perform a post-mortem on a dead program. Using it is slightly more efficient than scattering WriteString calls through the program.

With this convoy of Modula-2 compilers, you'll soon be "compile-bound and down, linked up and executing."

At 163K, the program is the largest of the three tested. The module definitions take up 90 percent of an Amiga floppy, making it impossible to add on the compiler and linker to make separate language and working disks, as I did with M2Amiga and Benchmark. You must either trim down the module disk to hold the compiler, or put the compiler, linker, and editor on your working disk. If you own a hard disk, you have already solved your space problem.

Besides being the largest, TDI is the most unstable. It crashed and sent me a guru meditation message several times while compiling modules with and without errors. Even with the required AmigaDOS stack of 30K, TDI died. One time it also corrupted my working disk. Equally annoying but less devastating, both the compiler and the linker always returned error code 507 to AmigaDOS, even after a successful compilation or link. Upon receiving the error code, AmigaDOS will kick you out of a batch compile.

The manual features definitions for each module and an index. Despite being neatly formatted, the manual was confusing to follow at times. Every page header in the Module Definitions section is one page off from the actual topic it refers to. Fortunately, the ►

headers in the text and the index are correct. More frustrating is the missing M2Conversions module, used for number-to-string and string-to-number conversions. While it was described in the documentation, it was not included on my disk.

I thought that after two years of being on the market, the TDI compiler would be solid. It's disappointing that it was unreliable, because it performed well in the timed benchmarks. Despite its four-pass compiler, it ran neck-and-neck with M2Amiga (see the accompanying chart).

M2Amiga

Distributed in the United States by Interface Technologies Corp., the M2Amiga Compiler originally hails from Switzerland and the A.+L. Meier-Vogt Company. The one-pass compiler (135K) is icon-based, so you can run it from Workbench. Somewhat faster than TDI, it clocked consistent compile and link times over several runs.

I used M2Amiga to debug the benchmarks for mismatched and mixed types. Its built-in MicroEmacs-based editor successfully recognized error files from the compiler, and an error-finder mode similar to TDI's is available from a pull-down menu. Unlike TDI, however, it always found the errors, and it allows you to set compiler flags for turning on and off various error-catching runtime code from the compiler command line as well as in the source code of a file. The whole edit/compile/link process was easier. The linker is fast and even lets you make icons for finished executable files.

Interfacing Modula-2 and AmigaDOS is much simpler with M2Amiga. Unlike TDI and Benchmark, which require you to call certain Heap setup/shutdown routines, the M2Amiga runtime system handles all AmigaDOS setup/shutdown. With Benchmark, you even have to initialize the math library.

M2Amiga is a little rough in some areas, including the documentation. Printed in dark blue on grayish thin-stock paper, the manual is hard to read and flimsy. It lacks an index, and the module descriptions are difficult to read. A+L. Meier-Vogt does include some demos to give you an idea of the power of the language.

Be prepared to wait when installing the compiler on a boot disk. The installation program takes over 14 minutes, perhaps because M2Amiga is set up to handle one- or two-drive systems and must read an entire source disk before writing. The delay is necessary to make the compiler work properly on one disk. Without installing, the program repeatedly requested to remount my system disk.

You are also forced to set up a project directory structure to compile in, with sym, obj, and ref subdirectories for each project. The linker, however, does not automatically recognize this structure; you must direct the linker to the proper object file.

Both the compiler and linker produce information for an optional debugger mentioned in the manual. The only "description" is in the Amiga Run Time System module section. The paragraph reads more like an ad, saying a debugger exists and can be installed; please ask your dealer for details. I don't mind ads, but don't tease me.

Benchmark: Modula-2

Distributed by Avant Garde Software, Benchmark: Modula-2 is a one-pass compiler (103K) and has several optional module libraries. The main disk includes a configuration tool that lets you change a number of compiler options to your defaults instead of Avant Garde's. You can set these from the compiler command line or from within the source code. There is a choice of two integrated editors, with an extra twist: You can run the compiler and linker from them. A handy Benchmark extra is a procedure profiler, which is very useful for fine-tuning an application.

You can expand your system with the optional module libaries, including an IFF module library, a "C Language Library", full of C-like functions to ease the transition for diehards like me, and a "Simple Amiga Interface" module library with easy windows, menus, and gadgets.

Benchmark uses the Motorola Fast Floating Point library for speed, but thus does not support the

Benchmark Tests

Preparation Times (all times in seconds)

	TDI	M2Amiga	Benchmark
Combined Test			
Compile	88	55	34
Link	149	39	42
Size of Exec.	33.8K	29.1K	42.4K
FFT			
Compile	56	45	27
Link	144	32	34
Size of Exec.	35.2K	19.6K	21.8K

Execution Times (all times in seconds)

	TDI	M2Amiga	Benchmark
FFT	29.3	29.7	28.7
Permutation	5.9	9.6	5.3
Towers	6.9	9.3	7
8 Queens	2.8	3	2.7
Int Mat Mult	12.5	9.9	8.6
Real Mat Mult	16.5	15.7	21.2
Puzzle	25	28.6	27.5
Quicksort	6.2	5.3	5.5
Bubble Sort	8	8.7	7.6
Tree Sort	7.9	14.2	9.9

LONGREAL (64-bit real) variable type. Both TDI and M2Amiga supported the type; Benchmark would have had to access AmigaDOS' IEEE floating-point math library to do so.

Your variables are further constrained by the static data-storage area, limited to 32K per module or procedure. This is not a big deal if you break up your variables and arrays beforehand, but you might have to rearrange your data when porting programs between Modula-2 compilers. As a result of its data-segment layout, Benchmark generates bigger code segments than the other two.

Surprisingly, with all the range-checking and overflow-checking code it has, the program does not check for stack overflow. I overran the limit once and had to backtrack from the symptoms to discover my mistake.

The documentation is exhaustive, and demos are abundant (text, graphics, sound, and more), although most are converted from C public-domain programs. The documentation is extenstive, but does not have an index. The "Definition Module Cross Reference" section allows you to look up an identifier, find the module it appears in, and then thumb back through the book to find that description. Both the manual and main bootable disk include tutorials.

THE WEIGH STATION

A mixed bag of tricks, the benchmark tests put the three programs up on the scales and sent them through their comparative paces, exercising recursion, array indexing, integer and real math, pointer dereferencing, and structure accessing. I ran a heavily recursive permutation calculator, a Tower of Hanoi solver, an Eight Queens solver (done 50 times), Puzzle (a math and array intensive compute-bound benchmark by Forest Baskett), Integer and Real Matrix Multipliers (40 × 40 arrays), three sorts (Quicksort, Tree Sort, and Bubble Sort, each over 5000-element arrays of random numbers). I also tested a separate Fast Fourier Transform program, with an array of 256 complex numbers described as records. Originally the test was bundled with the others, but the combined static data size was too large for Benchmark Modula-2 to handle. All the benchmarks output only to the screen, because I/O is more a function of an Operating System than a compiler.

My test setup was a two-floppy system, with compiler, linker, and module descriptions on floppy and my AmigaDOS CLI commands in the RAM disk. I used each system's editor on the source for that system, but with TDI, I frequently had to fall back on MicroEmacs. I timed each procedure separately, using the DateStamp AmigaDOS call to get the current time before and after each module call. Between compilers, I changed only the names of data types imported from Amiga Modules and the names of the imported modules themselves. The combined test was ►

MODULA-2 ROAD SIGNS

FINDING YOUR WAY around in a foreign language is never easy, so to ease the transition for diehard C programmers, I have compiled the following list of Modula-2 equivalents for C commands. Control structure translation is a simple affair.

THE C STATEMENT	IN MODULA-2 BECOMES:
`if (x != 15)`	`IF (x # 15) THEN`
`{`	`    WriteString('It is not 15! It is ');`
`    printf("It's not 15! It's %dn",x);`	`    WriteInt(x);`
`}`	`ELSE`
`else`	`    (* manipulate x here *)`
`{`	`END;`
`    /* manipulate x here */`	
`}`	

Similar conversions apply for while, do while, for, and switch. Modula-2 does not support goto. Less obvious Modula-2 cognates for some frequently used C features are listed below.

```
C                                   MODULA-2
#include. . . . . . . . . . . . . .FROM module IMPORT xxx, xxx
#define . . . . . . . . . . . . . .CONST
unsigned . . . . . . . . . . . . . .CARDINAL
unsigned long. . . . . . . . . . . .LONGCARD
long int . . . . . . . . . . . . . .LONGINT
int *fred . . . . . . . . . . . . . .fred : POINTER TO INTEGER;
NULL. . . . . . . . . . . . . . . . .NIL
i++ . . . . . . . . . . . . . . . . .INC(i);
i += 5 . . . . . . . . . . . . . . .INC(i,5);
i-- . . . . . . . . . . . . . . . . .DEC(i)      (* Ditto for DEC(i,5) *)
sizeof . . . . . . . . . . . . . . .SIZE (variable), TSIZE (type)
/* flags - several lines */ . . . . .(* sets - several lines *)
    #define FLAG1    0x01               CONST Flag1 = 1; Flag2 = 2;
    #define FLAG2    0x02               Flag3 = 0FH;
    #define FLAG3    0x0F               TYPE FlagSet = SET OF [0..31];
    int flagword;                       flagword : FlagSet;
    flagword |= FLAG1;                  flagword := flagword +
    flagword &= ~FLAG2;                 FlagSet { FLAG1 };
    if (flagword & FLAG3). . .          flagword := flagword -
    /* end of FLAGS */                  FlagSet { FLAG2 };
                                        IF (Flag3 IN flagword) THEN . . .
                                        (*END OF SETS*)
/* I/O */. . . . . . . . . . . . . . .(* I/O*)
    printf("Vars %d %f %c %sn",      WriteString('Vars ');
      int_i, float_f, char_c,         WriteInt(int_i);
      string_s);                      WriteReal(float_f);
/* ditto for input */                 Write(char_c);
                                      WriteString(string_s);
                                      WriteLn;
                                      (*DITTO FOR INPUT*)
```

—DMcC

over 725 lines long, the FFT over 260 lines. The differences in sets of imports, type-casting, and setup calls varied slightly the length for each compiler. See the benchmark chart for the results.

Inspector's Report

All three clock similar speeds for code generation. Benchmark's floating point code pulls ahead, but not by much. I do not recommend the TDI compiler, at least until the company fixes version 3.01a's problems. The code is about the same quality as the M2Amiga compiler, but you'll spend a lot of time with the compiler up on the debugger's rack, rebuilding after guru messages. Its other tools are also not up to snuff. M2Amiga is a little more solid, but the documentation is far from helpful to the beginner. Because it is very new, the Benchmark compiler still has to be broken in a bit. Slightly unwieldy in tight corners, Benchmark's code size is the largest, but it's the one I recommend. It handles at least as well as the M2Amiga compiler, and Avant Garde gives you a lot more for your cash. Next year's model should bring even better performance.

Product Information

Benchmark Modula-2
Avant Garde Software
2213 Woodburn
Plano, TX 75075
214/964-0260
$199.95
$99.95, library modules
512K required.

M2Amiga
Interface Technologies Corp.
3336 Richmond, Suite 200
Houston, TX 77098
713/523-8422
$249
512K required.

TDI Modula-2
TDI Software Inc.
10355 Brockwood Rd.
Dallas, TX 75238
214/340-4942
$99.95 basic; $149.95 developers;
$299.95 commercial
512K required.

David T. McClellan is a contributing editor to AmigaWorld. *Write to him at 104 Chevron Circle, Cary, NC 27511. The author would like to thank John Hennessy, who originally collected the benchmark tests used in this article, Peter Nye, who modified them somewhat, and Pete Soper, who brought them to his attention.* ■


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Say It . . . With Video Text

Create your own repertoire of special effects with this Amiga Basic video text program.

By Bryan D. Catley

With video text, you have the ability to produce on a computer monitor enlarged text that can be transferred to videotape as program titles or photographed as slides for use in presentations. Using a number of different programming techniques, you can create a wide range of special effects to enhance your titling efforts and other presentations. The Amiga Basic program—Basic Video Text (see Listing 1)—that follows this article makes full use of the Amiga's potent graphics capabilities to provide you with the tools to use video text with professional-quality results.

Consider the following features: Up to 29 colors; horizontal enlargement up to 10 times; vertical enlargement up to 20 times; upper- and lowercase; plain, underlined, italicized, and boldface text styles; combinations of text styles; shadowed text; drop shadowed text; strobe text; outlined text; horizontal striping; vertical striping; the ability to "undo" the last item drawn; a grid to assist in text placement that may be toggled on and off at will; the ability to scroll the screen to fine-tune text placement; an optional borderless screen; and more.

Many Items on These Menus

Type in the program and save a copy before running it. Basic Video Text is completely menu driven. When you execute it, you will be presented with a title screen that is displayed while the program initializes itself. The screen then clears to a grid-covered plain background, and the program will wait for your menu selection. Note that many of the menu selections are on/off toggles. This means the menu will always show what can be selected (which, naturally enough, is the opposite of what is currently in place). Further, many of the menu items are ghosted when their selection is not appropriate.

To get you started, let's look at the four menus and the items they control:

1. The Big Text Menu

This menu doubles as a project menu and the menu that controls the text. Menu options include:

Open/Close Opens or closes the text input window. You can "drag" this window to any location on the screen. Once opened, it cannot be closed until you press Return.

Clear It Clears the text input window and readies it for new input. Valid only after you press Return.

Draw It Draws an enlarged version of the entered text at the Block Cursor (see below) position.

Erase It Clears the enlarged text completely. ("Undo" may be used to restore the enlarged text.)

Place It Sets the Block Cursor to wherever the mouse is clicked.

Undo It Removes the last item drawn.

Grid ON/OFF Toggles the grid on and off.

H Stripe ON/OFF Toggles a transparent horizontal stripe on the enlarged text (as it is drawn) on and off.

V Stripe ON/OFF Toggles a transparent vertical stripe on the enlarged text (as it is drawn) on and off.

Draw Factors Opens a window that allows you to set the horizontal and vertical drawing factors by clicking in the appropriate box. By default, both factors are set to five.

Quit Quit Basic Video Text and return to Amiga Basic.

2. The Pens Menu

This menu allows you to set the various colors you wish to use. Options include:

BG Color Allows you to choose a new background and border color by clicking in one of the displayed colors. The change is instant.

Grid Color Allows you to choose a new grid and frame color by clicking in one of the displayed colors. The change is instant. Note: If the grid color is changed to that of the background (or vice versa), the result is a borderless screen. The menus, however, will also disappear—although selected menu items will become visible.

FG Pen Allows you to choose a new drawing pen by ►



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clicking in one of the displayed colors. The current FG Pen color (which is red by default) is always used to draw the Block Cursor. Existing colors are not effected.

OL Pen Allows you to choose a new outline color by clicking in one of the displayed colors. By default, the outline color is always the same as the FG Pen color. The current OL Pen color is shown across the top of the Block Cursor.

3. The Style Menu

This menu allows you to select various text styles. Options include:

Plain Text is drawn using the standard Amiga text display; checked when selected.

Underline ON/OFF Toggles text underlining on and off.

Bold ON/OFF Toggles bold text on and off.

Italics Text is drawn in italics; checked when selected.

4. The Scroll Menu

This menu allows you to scroll the screen contents in any direction. Options include:

Left The screen scrolls the selected number of pixels to the left.

Right The screen scrolls the selected number of pixels to the right.

Up The screen scrolls the selected number of pixels upwards.

Down The screen scrolls the selected number of pixels downwards.

× 2 Scroll two pixels; checked when selected.

× 4 Scroll four pixels; checked when selected.

× 8 Scroll eight pixels; checked when selected.

Final Checklist

You are now ready to use the program, but there is one thing of which you should be aware. The program uses most of the memory available in a 512K machine. This means you should not be overly concerned if you receive an "Out of Heap Space" message; you will simply have to reboot your Amiga. Many functions (such as speech, cut and paste, and so forth) use memory that is not released when the function terminates—thus the reason for this temporary available memory problem.

How do you transfer the screen image to your VCR? On an Amiga 1000, use a video cable with an RCA-type jack at each end—plugging one end into the composite-video-output jack on the back of your computer and the other end into the video-input jack of your VCR. Then simply press record. (Be sure to check your VCR instruction book for details on using the video-input jack.) With an Amiga 500 or 2000, you will need an RGB encoder.

If you wish to photograph the screen, be sure to use a shutter speed of less than one-sixtieth of a second (because the screen is redrawn 60 times a second).

Sample Video Text Techniques

The following ideas should get you started with Basic Video Text:

Shadowed Text Set the FG Pen to black, draw the text, move the Block Cursor a little towards an upper corner of the screen, change the FG Pen to another color and draw the same text again.

Drop Shadowed Text Use the same technique as that described above, but move the Block Cursor a little further.

Strobe Text Use the same method as that described for shadowed text, but repeat it a number of times in different colors.

Outlined Text Select a color for the OL Pen that contrasts with that of the FG Pen.

Hollow Text Set the FG Pen to the background color and the OL Pen to a contrasting color.

Translucent Text Set the horizontal drawing factor to 2 and select Vertical Stripe ON (or vice versa).

Patterned Text Draw the text in any desired color, set the FG Pen to a contrasting color, set both Vertical and Horizontal Stripes ON and redraw the same text in the same location.

Flat Text Set low vertical and high horizontal factors.

Tall Text Set high vertical and low horizontal factors.

These are just a few of the many effects you can create with Basic Video Text. You will be surprised at what you can achieve with various combinations of the above techniques. All you need to do is go ahead and experiment. ■

Bryan Catley is a professional software engineer with 20 years' experience with IBM mainframes and a little less with Amigas. You can write (no calls) to him at 2221 Glasgow Road, Alexandria, VA 22307.

Listing 1. Basic Video Text

```
' Basic Video Text, for AmigaWorld
' -------------------------------
' Bryan D. Catley, May 1987
'
CLEAR ,25000:CLEAR ,53000&
DECLARE FUNCTION TextLength&() LIBRARY
NumCols=32:r=0:g=1:b=2:ScWid=311:ScDep=198
bg=0:grid=2:LRed=3:Red=4:DRed=5:LOrg=6:Org=7:DOrg=8
LYel=9:Yel=10:DYel=11:LGrn=12:Grn=13:DGrn=14:LBlu=15
Blu=16:DBlu=17:LVio=18:Vio=19:DVio=20:LMag=21:Mag=22
DMag=23:LBrw=24:Brw=25:DBrw=26:LGry=27:Gry=28:DGry=29
```

Listing continued on p. 87



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Unassigned Territory

Exploring this month's CLI commands will help you organize your disks and disk space more effectively.

By Mark L. Van Name and Bill Catchings

OVER THE PAST few columns in our series, we have been examining several groups of common CLI commands. Most of them you will probably use quite often. There are other commands, however, that provide important functions that help you manage your disks.

To use a disk with your Amiga, you must first FORMAT it. The FORMAT command gives you a disk that is initially empty (except, perhaps, for a Trashcan icon and directory), and on which you can store data. That's fine for data storage, but if you want to turn that disk (or any other) into one that you can use when your Amiga boots and tells you to insert the Workbench disk, you have to prepare it further. You could simply DISKCOPY your Workbench disk onto it (in which case you did not need to format the target disk first). This approach, however, would overwrite any other files that are already on the disk.

Put Your Disks on the Installment Plan

Instead, you can make your own customized boot disk—perhaps even one that contains a streamlined CLI and no Workbench. This is where the INSTALL command helps you out. Its only argument is a disk drive identifier:

INSTALL [DRIVE] DFn:

where *n* must be either 0, 1, 2, or 3. It makes the disk in drive *DFn:* "bootable."

INSTALL is really only the first step in this process. It puts just enough on the disk to let your Amiga boot from it and give you the CLI's 1> prompt. It does not automatically bring up the Workbench. More importantly, it does not copy any of the CLI's command files onto this disk. To be able to use them, you have to copy them from a Workbench disk into the C directory of this disk.

INSTALL has one other unfortunate limitation: It does not ask you to insert your target disk into the drive you specified. Instead, it immediately starts to work on the disk in that drive. If your Amiga has only a single drive, or if you expected to be asked to insert your disk and specified a drive that contained another disk, you could be in for a surprise. On a one-drive system, you have the Workbench disk in your drive, because it contains the INSTALL command file. You enter the INSTALL command, and it puts its information on your Workbench disk—not what you wanted.

There are two easy ways around this problem. The first is to copy the INSTALL command into the current directory of your target disk, put that disk in your drive, and then run INSTALL from there. The other approach is to copy the INSTALL command file from your Workbench disk to RAM:, remove the Workbench disk, insert your target disk, and then run INSTALL from RAM: by typing

RAM:INSTALL DF0:

Now you can copy any other files you need onto your disk and be on your way.

If you forget this procedure and see that INSTALL is starting to work on your Workbench disk, you might be tempted to open the door to your drive and remove the disk. If you have used an Amiga for any length of time, you know that this is one of the quickest ways to ruin a disk—but every so often you may forget. When you do, AmigaDOS can leave the special file structures that it keeps on the disk to help it manage your files in inconsistent states, so that your files are effectively lost. Even if you are extremely careful never to make this mistake, disks still sometimes go bad.

Spotting a bad disk is usually simple. You may not be able to read from it or write to it. More often, you try to use it and AmigaDOS is unable to validate it. When that happens, you get messages such as

"Volume
<volume name>
is not validated"

or

"Error validating disks
Disk is unreadable"

The DISKDOCTOR command can often help you cure such ailing disks. Simply put the bad disk in a drive DFn: and type

DISKDOCTOR DFn:

It then fixes as much of the file structure as it can, so that you can retrieve your ►

files. It often does not get them all, but it usually gets most of them. If DISKDOCTOR is able to recover some or all of your files, it tells you

"Now copy files required to a new disk and reformat this disk."

Don't ignore this message. Just because DISKDOCTOR has saved some files does not mean that you can trust your disk. You should COPY (not DISKCOPY) all of the files that you want to save from this disk onto another one. Then FORMAT this disk and COPY all of your files back onto it, and you can get back to work safely.

When you FORMAT this disk or any other one, you have an opportunity to give it a name, which AmigaDOS calls its volume label. If you want to change that name, however, the best way is not reformatting your disk. Instead, use the RELABEL command:

RELABEL [DRIVE] DFn: [NAME] <new name>

The disk's new name must follow the usual AmigaDOS rules. It can contain up to 30 characters, and if you want it to contain any spaces, surround it with quotes.

RELABEL shares one problem with INSTALL: It does not ask you to insert your target disk; instead, it immediately changes the name of the disk in the drive you specified. You can avoid this problem by using either of the approaches that we described for INSTALL.

AmigaDOS lets you do more than manage a disk's name or contents. In a limited way, you also can make it run faster by using the ADDBUFFERS command:

ADDBUFFERS DFn: <number of buffers>

When you read a file on a disk, AmigaDOS actually reads that file in chunks called sectors. It keeps some of these sectors in memory areas called sector cache buffers, so that it can get them more quickly if you need them again. Because many programs tend to read the same disk area several times during their execution, these cache buffers can improve your overall disk performance.

ADDBUFFERS tells AmigaDOS to keep more of these sector cache buffers. You generally need 25 to 30 additional buffers to get a noticeable improvement in your disk performance. There are no hard and fast rules to tell you how much improvement you will get from any number of additional buffers. Instead, your best bet is to start with an additional 25 buffers and see if it helps. You rarely need more than an additional 50 buffers for a drive. Remember, if you really want to speed up access to a few files, copy them into RAM: and you will not have to use the disk at all to read them.

These extra cache buffers are not free, of course. Each one consumes about 500 bytes of your available system memory. For 25 additional buffers, you burn about 12.5K. This may not seem like much, but on a 512K Amiga, it could decrease the size of the spreadsheet or paint file you can use, or stop a tight-fitting program from squeezing into memory. On an Amiga with 1MB or more of memory, these extra buffers are often well worth the cost. On such a system, you might even want to put ADDBUFFERS statements for each of your drives into your startup-sequence file.

Okay, Let's Check Out the Files

Whether your disk runs fast or slow, you often need to see what it contains. The DIR command (see "info.phile," p. 61, in the March '88 issue of *AmigaWorld*) is one way to see a list of your files. AmigaDOS provides another such command—LIST—that lets you get more information about your files.

LIST has many options. You can get a great deal of useful information from it, however, without having to use any of these options. Just enter

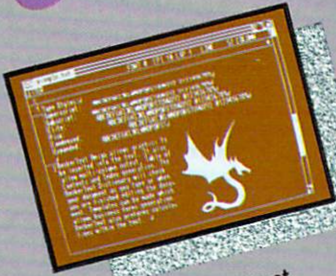
LIST

It displays the following categories of information about the files in your current directory:

file_name
size
protection
date
time
:comment

Unlike DIR, LIST does not show you the files in sorted order; instead, you get them as AmigaDOS chooses to present them. It tells you more than DIR, however, by giving you these five other pieces of information about each file. The size field shows each file's size in bytes. If a file contains nothing, this field ►

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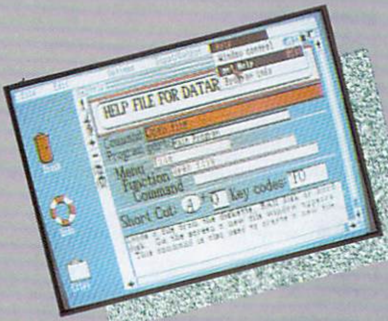
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says "empty." It also treats directories differently from files and displays "dir" in this field for them.

The protection column tells you what operations you can perform on each file. It contains some combination of four letters: r (Read), w (Write), e (Execute), and d (Delete). As you are probably the owner and sole user of most of your files, their entry in this column reads "rwed," which means that you can perform any operation on them.

You can use these operation designators and another AmigaDOS command, PROTECT, to stop other users from hurting files accidentally. PROTECT accepts a file name argument and a list of zero or more of these four options:

PROTECT [FILE] <file_name>
[FLAGS <options>]

If you want to stop an operation, just omit its option designator from the list after the keyword FLAGS. For example, if you want to put a file called copyright_notice on a disk and prevent anyone from deleting it accidentally, enter

PROTECT copyright_notice
FLAGS rwe

Right now AmigaDOS only enforces the d protection; even if you leave off all of the options and try to protect a file completely, you can still read, write to, or execute that file.

There are three other LIST headings. The date and time columns show you the date and time when each file was created. These can be very helpful when you are trying to decide which of several versions of a file is the most recent one.

The :comment field is another special one that, like protection, reflects the result of an AmigaDOS command. If you create a new file, its LIST entry shows nothing under that heading. You can, however, attach a comment to a file with the FILENOTE command:

FILENOTE [FILE] <file_name> COMMENT <comment>

Your <comment> can be up to 80 characters long, but if you want it to contain any spaces, you must surround it with quotes. You can use these comments for everything from file version information to a statement of a file's purpose.

If a file has a comment, its LIST entry shows that comment with a colon (:) preceding it. For example, if you have a 512-byte file *fred* with no special permissions, and you enter

FILENOTE fred COMMENT "This is Version 1.2 of my fred file"

its list entry might show

fred 512 rwed Today 12:11:03
:This is Version 1.2 of my fred file

You should be aware of the way that AmigaDOS handles these comments when you work with your files. Assume that you have a file *file1* with a comment. If you COPY *file1*, the copy does not have *file1*'s comment. On the other hand, if you RENAME *file1*, the resulting file retains *file1*'s comment. Finally, if you in any way update or overwrite the contents of *file1*, the result of that operation retains *file1*'s comment. For example, if you

COPY foo to file1

file1 contains the same information as *foo*, but it keeps its comment, even if *foo* had a different comment.

The LIST command always displays a file's comment. You can stop it from displaying the date and time information, however, with the NODATES option.

You can also get LIST to give you information about any particular file or directory by giving the name of that file or directory as its first parameter, after its optional DIR parameter. For example, the following two commands are equivalent:

LIST DIR <file_name>
LIST <file_name>

If <file_name> is a file, LIST gives you information about only that file. If it is a directory, LIST displays information about all of the files and directories within that directory.

LIST offers several other options that you might want to investigate further in your AmigaDOS User's Manual. Like the other commands that we have discussed in this and previous columns, it is a useful part of the powerful AmigaDOS software that controls your Amiga. In our next column we will begin a multi-part, in-depth look at the newest version of that software, AmigaDOS 1.3. ■

Mark L. Van Name and Bill Catchings are contributing editors to AmigaWorld. *Write to them at 10024 Sycamore Road, Durham, NC 27703.*


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The treasure hunt begins with this issue—the first 16 clues. The next two issues of *AmigaWorld* (August and September) will carry the clues for Parts Two and Three. All the clues are linked so you will need to solve each one before you can move to the next location. Decipher the clues correctly and at the end of the third set you'll know the location of the buried treasure—an Amiga 2000.

Be sure to save your answers to all the clues each month (you may need them). The exact *answer* to each clue will correspond to the word or words marked in italics. In the November issue we will publish the winner's name and the trail to the treasure with the answers to each clue in all three parts of the treasure hunt.

When you find the spot that X marks, you won't need a shovel to dig up the treasure.

All you have to do is fill out the coupon (or a facsimile) accompanying the third and final set of clues. All entries must be received at the *AmigaWorld* offices by Thursday, September 15, 1988. Send your entry to *AmigaWorld* Treasure Hunt, *AmigaWorld*, 80 Elm St., Peterborough, NH 03458. Only one entry per return address will be accepted. The winner will be selected in a random drawing of all correct entries held on Friday, September 16, 1988. Listen for your telephone notification on Monday, September 19th. Confirmation will follow by mail. Have your bags packed for the Getaway Weekend (Friday, Saturday, and Sunday), October 21–23 or 28–30 depending on your schedule.

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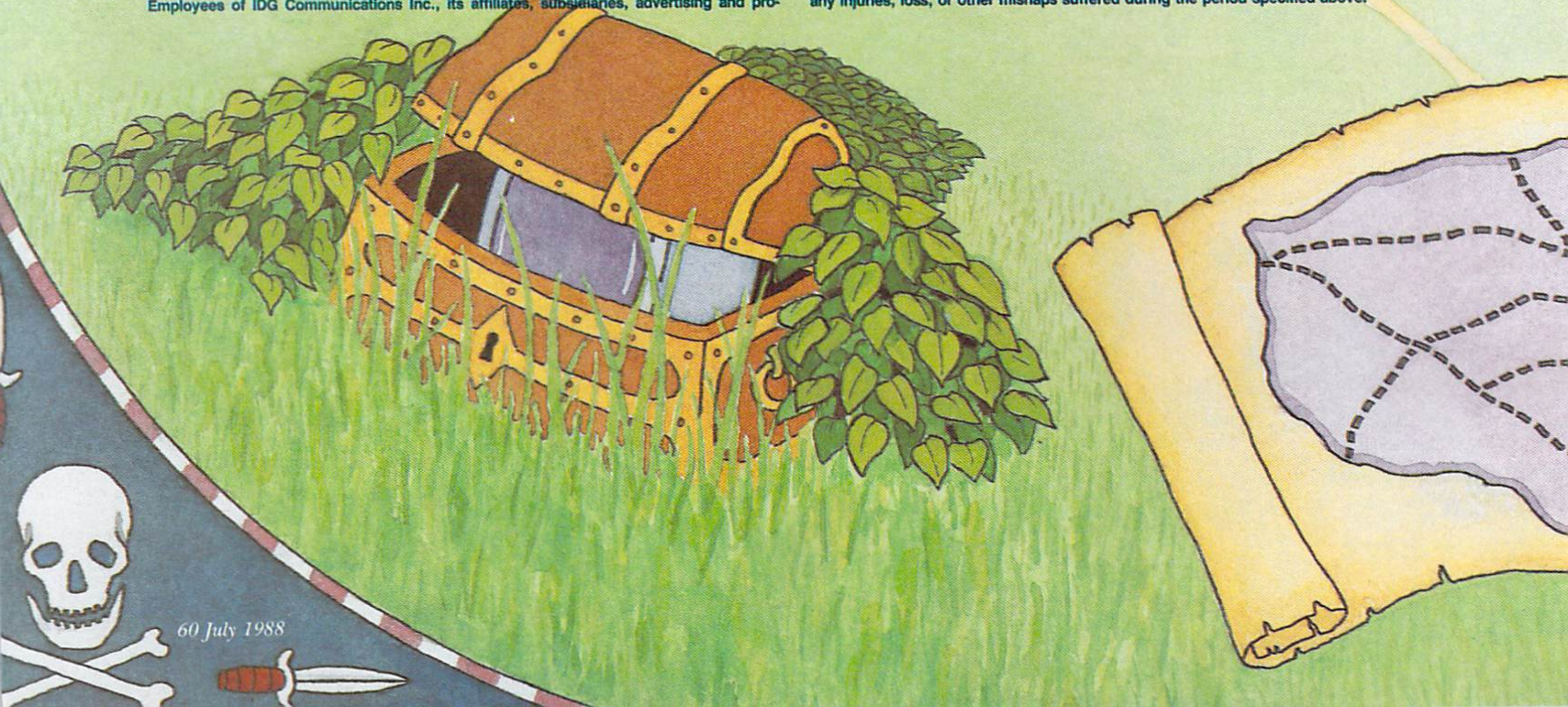
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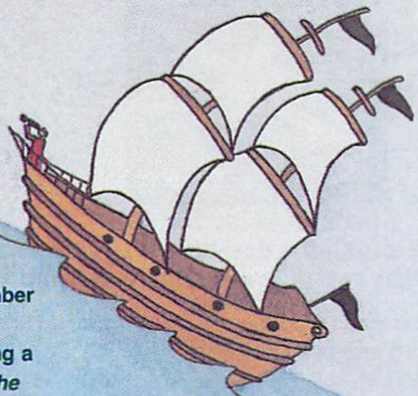
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'88 Treasure Hunt

A Getaway Weekend for 2



THE CLUES

1. Start your journey at the AmigaWorld editorial offices. Go west until you cross a *state* line.

2. In 1923, a famous resident of this state moved south by popular demand. Follow him to his new *home*.

3. Now, read the address on the mailbox and proceed to the *capital* of the state for which the street was named.

4. Catch "The Spirit" West out of town. Subtract the code number of the Amiga Basic Overflow error message and merge with another route. Where these divide follow the new route across two state lines and stop at the *capital* of your present state.

5. Continue on the same route, crossing three state lines until you reach the first large *city*.

6. Use a Beatles song to leave here by another route. Turn right when you come to the "Ketchup Road" at George's place and do some sports math to find your next route: Divide the number of players on a rugby (Union) team by the number on a basketball team; multiply that by the number on a cricket team; add the number of football players allowed on the field during a play. Continue in the same direction on *the new route*.

7. Cross the next state line and start thinking of the sponsor of the old TV show "Death Valley Days." Use that information and double it to find *your next route*.

8. Head towards a small hard place. When you get there, have a sports fantasy: Hit a grand slam home run, kick a field goal, score a touchdown, bowl a strike, score a hat trick, par a 150-yard hole, and sink a foul shot. Leave by *the appropriate route*.

9. Head to a place that three states helped name. Continue towards the state that contributed first until you reach a *"TV Town."*

10. Here, think of "Some Not Very Difficult Parts." Add that to your present route to find your new route. Head in the Confederacy's direction until you reach a *city* where you can make a "last stand."

11. Shoot an eagle on the Masters' 18th, add it to your score, and start "coasting" to the next *place*.

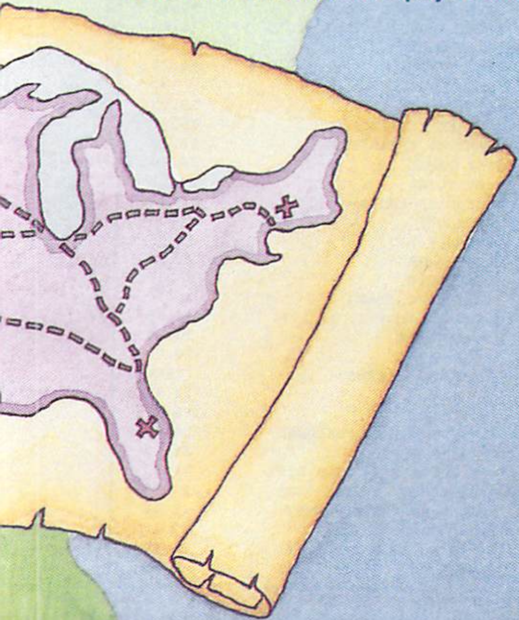
12. Here, look east and look west. Two lanterns in Old "Ollie's" place of worship will tell you which *direction* to go.

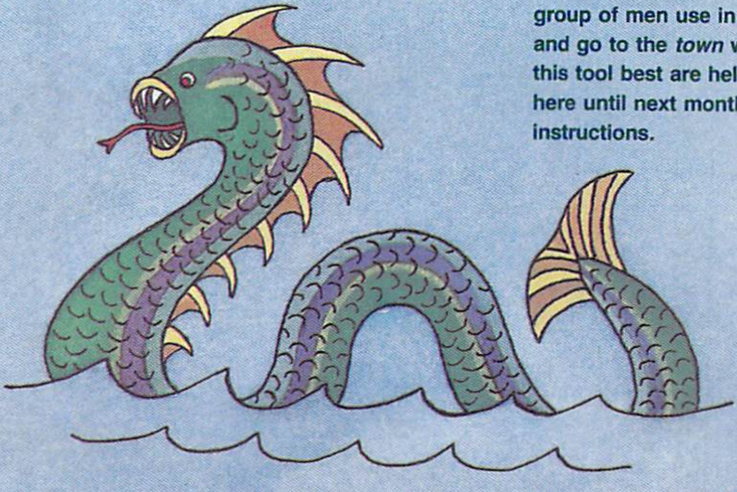
13. Proceed in that direction halfway across this new route. Think of something that Samuel Johnson, William Pitt, Charles Darwin, Winston Churchill, et. al might like after dinner. Follow this idea to the nearest state and go to its most well known *city*.

14. If you left this city by train at 4:45 pm, you should arrive at the *town* that is your next destination 6 hours and 3 minutes later.

15. Delete the fourth letter in the name of this place. It might now serve as a kind of nickname for *another city* about 400 or so miles away. Go there.

16. What would give this city the nickname suggested above is a tool that a particular group of men use in their work. Hop a plane and go to the *town* where the men who use this tool best are held in high respect. Wait here until next month for further instructions.





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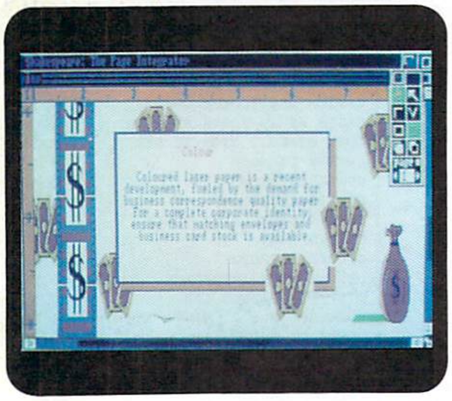
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from p. 18
but need occasional high-quality black-and-white print.

Because Shakespeare keeps your document and all related files in memory, 512K of RAM is barely enough to construct a simple one-page document. As memory diminishes, the system sometimes displays a message, but more often than not it hangs. Version 1.1 promises better memory management, with a memory monitor, but as it is, at least a megabyte is required to create publications of any complexity, and you'll need two drives to avoid disk swapping.

Shakespeare is cleverly conceived, tightly written and well documented, although the two pages of on-line help just refer you to the manual. The tutorials



Text and graphics, Shakespeare style.

are good, but no document examples are supplied (although the upgrade is to include design templates). A quick-reference card would come in handy.

Shakespeare does a reasonable job of integrating text and graphics and creating color prints. Those needing small quantities of color prints will find it useful. Its ability to drive a PostScript printer is admirable, but future versions should provide greater control of the PostScript environment and enhanced typographic abilities. Professional Page is still the only Amiga program to provide a truly satisfying link to PostScript printers. I'm looking forward to the update.

Shakespeare
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Micron Amiga Memory Board

Three ch:ers for two megabytes.

By Morton A. Kevelson

WHEN MEMORY IS the issue, experienced Amiga users will agree that more is better.

Micron Technology aims to please with a two-megabyte memory board available in a variety of configurations. All configurations start with the standard, 100-pin Zorro-2 card, with four-layer printed circuit structure containing embedded ground and power planes to minimize noise and crosstalk, socketed 256-kilobit 120-nanosecond dynamic RAM chips, and soldered logic chips. Purchased for the A2000, the board comes alone. The A1000 design adds a single-slot chassis, with or without an external power supply, and the board is packaged in a single-slot chassis with self-contained power box for the A500.

The version I tested was installed in the 13½-inch deep, all-metal Amiga 500 chassis with a power switch, power indicator, and a pass-through option for the 86-pin bus. You can open the 6 × 3½ × 3-inch power box for servicing. Its 2.0 ampere, five-volt rating should be adequate for the board, but not additional peripherals, and while the box generates positive and negative 12-volt outputs, the board does not appear to use these. When installed on the side of an A500, the chassis extends two inches behind the CPU and to within one inch from the front. It looms nearly 3½ inches above the keyboard, a position that may induce left-hand claustrophobia. If you plan to use the pass-through feature, you'll need to open the box and pull a set of terminating resistors from their sockets.

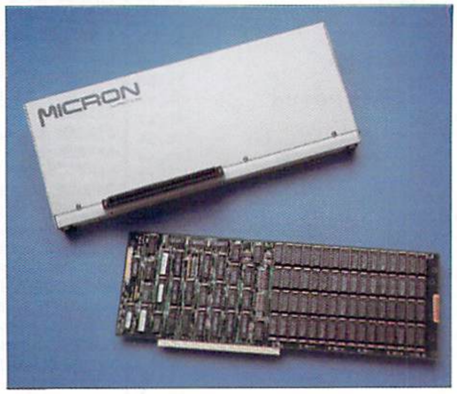
To test the unit on an A2000, I simply opened the chassis, removed the board, and installed it in a slot.

This memory board is specified as having zero wait states. Because dynamic RAM chips, used for all Amiga RAM, tend to "forget" their contents, they need to be periodically "reminded" by the dynamic RAM controller. If the controller's timing is not just right, the microprocessor must wait while the RAM is being refreshed. Zero-wait-state design insures that the refresh cycles will occur when the microprocessor is not accessing the RAM.

Software Solutions

We all know, too painfully well, that RAM will not retain any of its data once the power is turned off or the Guru appears. The Micron board comes with a remedy for such losses: a utility disk containing the justly-famous recoverable RAM disk (rrd).

In operation the rrd behaves like a floppy drive with the VD0: designation. To use it, you must add the rrd device handler to the devs directory on your Workbench disk, and modify the devs/mountlist and s/startup-sequence files. (A file on the distribution disk will modify a



Micron's A500 chassis and companion card.

copy of the Workbench disk to recognize the rrd.) The resulting startup-sequence will copy all AmigaDOS files to VD0: when you power up, and then reassign the appropriate devices and directories to VD0:. On subsequent warm boots the file-copy process will be bypassed if VD0: already exists. The initial boot on my Amiga 2000 takes nearly four minutes and ends up with 790 kilobytes in VD0, but a warm boot requires only 45 seconds (these times include a 12-second check of the installed memory).

Using the Install-VD0 utility, you can overwrite your existing startup-sequence and mountlist files. In some cases you may wish to combine the files with your own and edit the result. If you have a hard disk, for example, you will need to alter the mountlist and startup-sequence files. The one-megabyte default size for VD0: can be easily changed.

The utility disk includes complete diagnostics software. The PUMemtest pro- ►



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gram checks the memory board in about 12 seconds, and MemTest performs a detailed, 34-minute analysis of the system. You must remove a jumper from the board to run MemTest under AmigaDOS 1.2; A1000 owners can simply run it under version 1.1.

There are more utilities, too! A system monitor graphically displays memory usage, microprocessor utilization, and the number of running tasks. Activating the Clean-RAMDisk program immediately purges expansion memory of deleted files. The FastMem utility, designed for use with early Amiga programs that will not work properly with extra memory, effectively disconnects the expansion RAM.

Micron offers a one-year warranty on the board, which it will double if you mail your registration card within 30 days of purchase. This feature and the software bonus, plus the fact that it strikes me as a well-designed product, make the Micron Amiga memory board well worth considering.

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SuperGen

This genlock lives up to its name.

By Wayland Strickland

PROGRESSIVE IMAGE TECHNOLOGY, makers of the popular Video Charley for the PC, set out to develop a broadcast-quality genlock for the Amiga. The result is SuperGen.

SuperGen functions with all Amiga models. The device consists of a single circuit board enclosed in a 9×7×2-inch metal case, with two switches and two slide controls. One switch, a 3.58 MHz notch filter, lessens flicker and rainbow patterns by reducing the video-signal resolution. The second permits software control of both foreground and background dissolves, either simultaneously or individually. A graphics slider controls the amount of foreground graphics keyed over video, while a background slider dissolves between external video and the computer-generated background. The sliders function only if the unit is receiving sync from an external video source, yet the notch filter works whether receiving sync from an external source or the internal sync generator.

Two LEDs are located on the top of the genlock. One signifies when software is controlling the dissolve sliders. The other, a power indicator, not only tells you whether the unit is on, but also distinguishes between internal (red light) and external (green) sync generation, and an attempt to sync to an inferior external source (yellow).

Five BNC connectors hook the unit to professional video equipment. They are: key out (a black-and-white signal for connection to downstream or external keyers on video switchers), composite video input, loop through (to connect other equipment requiring the same video as the genlock), and two video overlayed outputs, the signals from which are identical. Because consumer video gear uses standard RCA connectors, you'll need an inexpensive adapter (from an electronics store) to link such pieces.

SuperGen connects to the Amiga's RGB port via a four-foot ribbon cable specially shielded to prevent radio-frequency interference. While the cable on early units does not connect solidly, the manufacturer informed me that a different case, designed to correct this problem, is being shipped with new units.

On the back of the genlock are eight dip switches (one unused), that permit various configurations: video termination to 75 ohms, a blanking source (internal or external), fast tie clamp (DC restore for use with broadcast equipment), setup adder (adds a setup value of 7½ IRE—a video-level measurement standard developed by the Institute of Radio Engineers—to the computer's graphics), key level (either one volt P-P 75 ohm terminated or transistor-transistor logic levels), four-line offset (used to correct centering of software designed for the Commodore genlock), and field select (to determine the starting field of video data according to your Amiga model).

Testing One, Two

SuperGen genlocks to any NTSC (National Television Standards Committee) interlaced video source, and will switch to its built-in RS-170A generator if no signal is present. SuperGen's composite-video out conforms to the RS-170A standard when syncing from either an external source or the generator. I verified this using a waveform monitor and vectorscope.

I used the same set of color bars throughout my tests. The waveform monitor showed the white bar at 100 IRE, chroma at 20 to −20, and sync being −40; exactly as they should be. I used the setup adder to insure that the blacks would not be too black (some older video equipment has problems with black being at exactly 0 IRE). The vectorscope showed that again SuperGen synced right on target, both externally and internally.

To see if SuperGen would function properly with a broadcast switcher (I tried it with a Sony SEG-2550), I connected it in two configurations: to the downstream keyer, and as a standard video source. I plugged blackburst from the house-sync generator into the video input of the SuperGen, and made sure the termination switch was enabled. Then I hooked one of the video overlay outputs to the downstream keyer's video input on the SEG-2550. I joined SuperGen's key output to the switcher's downstream-keyer's key input and loaded Pro Video CG1 (PVS Publishing). Finally, I typed in text of different colors and font sizes, adjusted the key level on the switcher, and—Presto!—all keyed as well as, or better than, our studio's ten thousand-dollar Chyron character generator.

To join SuperGen with the SEG-2550 switcher as a standard video input, I connected a video-overlay output of SuperGen to one of the switcher's video inputs (these inputs can be cameras, VTRs or character generators) again with the house sync generator supplying blackburst to SuperGen's video input. Here too, SuperGen genlocked correctly. Using an interlaced picture for a background, I discovered only one problem: the subcarrier (tint) was approximately 80 degrees out of phase. To remedy this, I inserted a video delay, capable of adjusting the subcarrier, between the blackburst cable and SuperGen. Once in line and adjusted, no other difficulties arose. Progressive Image Technology is currently developing a source synchronizer to address this concern. ►

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SuperGen does not degrade the incoming signal by decoding it into RGB components and re-encoding it with graphics overlayed. It simply encodes the Amiga's RGB into RS-170A composite video and overlays or keys the graphics on incoming video (similar to downstream keyers on broadcast switchers).

To see if SuperGen would lock to a camera or an non-time base corrected VTR, I connected a cable from an Ikegami 730AP studio camera to the video-in of the SuperGen, and one of the video overlay outputs to a studio monitor. Once again I loaded Pro Video CG1 and typed several lines of text in varying sizes and colors. I experimented with the sliders at every conceivable level. The results were very impressive; the lettering was clean and the picture quality as good upon reaching the monitor as it was when entering the genlock. I tried this test on the output of pre-recorded 1-inch, ¾-inch VTRs and ½-inch VCRs (Beta and VHS) with the same results.

No Sweat

SuperGen's software permits you to make smooth transitions. It is easy to understand and is not required for day-to-day use with one exception: the A500 and 2000 do not automatically start to interlace when connected to a genlock. To correct this you must execute a short program in the startup sequence. Two files on the disk permit you to interface programs with SuperGen's remote-control mode. Some software (Video Titler by Aegis, for one) already supports this mode, and others (PVS Publishing's Pro Video Plus) are looking at adding it.

I have used my SuperGen for five months on my A1000 with a two-megabyte memory expansion, an external drive, Mimetic's sound sampler and Digi-View (NewTek); all connected without any problems. I also tried it on an A500 with no difficulties. Because of a design inconsistency on the A2000 motherboard though, occasional problems have arisen with it. Not to worry though, Progressive Image Technology has been able to get every SuperGen to work properly.

I cannot recommend SuperGen enough for its performance and versatility. The price is considerably less than a separate RGB video encoder, and you get a built-in downstream keyer. But by far SuperGen's most outstanding feature is the unique notch filter. The unit is slightly expensive for the home user, but dollar for dollar, I do not think you will be disappointed.

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Progressive Image Technology
distributed by Digital Creations
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InovaTools

Tools, toys, and tricks for gadget-happy programmers.

By Bryce Nesbitt

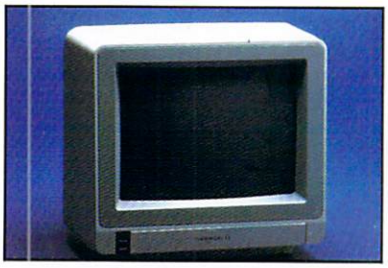
NOVICE AMIGA PROGRAMMERS are often surprised to learn that some common constructs, such as scrolling list ►

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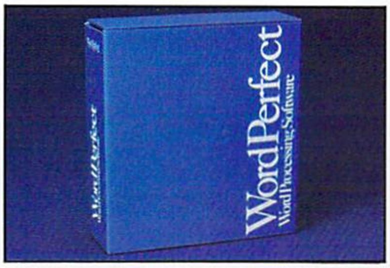
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boxes, are not part of the operating system. This leaves the poor programmers to roll their own using the low-level tools that the Amiga does supply—unless they have InovaTools.

InovaTools closely resembles Intuition, the Amiga user interface toolbox. Except for the fact that you'll need to look in a different manual for documentation, you might never know the difference. Inovotronics has duplicated all of the tools and include files that Commodore supplies for dealing with standard libraries. The program is all set up for calling from Lattice C, Manx C, or Amiga Basic. You don't even have to use it as a library; you can optionally link InovaTools directly into your program.

The manual is excellent. A summary, modeled after the ones in the Amiga manuals, is supplied for each function. Fortunately, there is one major difference; the author of the InovaTools manual has more than just a passing acquaintance with the English language.

Soup to Nuts

The 57 different functions range from a few silly baubles hardly worth the trouble to call, all the way up to major blockbusters. The most significant are a list manager for creating scrolling boxes (of text or anything else), draggable gadgets similar to Workbench icons, knobs for creating 360-degree rotational controls, a file requester (not great, but better than starting from scratch), pop-up menus (they work like normal menus but can appear anywhere on the screen), and fancy open and close window calls with flashy zoom-box effects.

Inovotronics provides a demonstration program in C to give some guidance in getting started. While all of InovaTools' #INCLUDE structures must be hand coded, Inovotronics promises that version 2.5 of their popular Power Windows utility will automate this.

InovaTools does not come with source code. If a bug or missing feature becomes a problem, you may just end up stuck. Inovotronics has promised to update the product, and you may need to take them up on the offer. I found it moderately buggy, with several random-synchronization and error-handling problems that cause crashes.

InovaTools makes quick work of some very tedious programming chores. If your time is worth anything to you, InovaTools will probably pay for itself on the first use. Even if your interest is purely recreational, InovaTools can give your program a professional touch.

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Graphics Studio

A penny-wise proxy.

By Sheldon Leemon

HAD ACCOLADE'S GRAPHICS Studio appeared about two years earlier, it would have been regarded as a worthy competitor to paint programs such as GraphiCraft and Aegis Images. But ►

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Amiga graphics software has come a long way since then. DeluxePaint and DeluxePaint II (Electronic Arts) set new standards with advanced editing features and easy-to-use interface. Now that standard is being challenged by third-generation packages offering 3-D image mapping, overscan, and true all-mode editing. Consequently, Graphics Studio can only be viewed as a low-cost alternative to state-of-the-art paint packages.

Novelties to Please

This isn't to say that Graphics Studio does not contain useful, unique features. The program comes with a full assortment of drawing tools, including freehand, line, box, and circle tools. The box tool lets you draw rectangles with squared or rounded corners. You can outline or fill circles, ovals, and boxes, and draw a series of concentric figures as well. You can also specify that the interior of a box be filled with grid squares. The Graphics Studio's fill tool is the only one I've seen that uses the inherent power of Amiga graphics routines to fill over one or several colors, until a border color is reached. It also lets you fill in horizontal and vertical stripes, and draw filled polygons with freehand curves. One tool lets you type in text, and keeps the block "floating" until you position and then anchor it by clicking the mouse button.

A number of options let you modify the effects of the tools. You can select five degrees of thickness, and eight shapes for your drawing brush including a text shape. You can also choose a density pattern ranging from solid to a thin spray. This allows you to "airbrush" not only freehand, but with any of the drawing tools, such as the box and circle tools. Similarly, a fill pattern can be used for drawing as well as filling. You can select one of 32 colors and one of six patterns for your drawing pen, to create a circle using a plaid airbrush, for example.

The Graphics Studio includes a number of special effects including mirror draw and color rotation. Some of the unique effects are the shadow mode, which allows you to automatically create a drop shadow behind your drawing, and filled-shape outlining, which allows you to specify that a line be drawn around any shape, using current brush settings. The repeat feature allows you to clone the last geometric shape drawn. Other features include a spare screen area you can swap with the normal screen, printing capabilities, and a clip (brush) tool which allows you to copy or cut rectangular areas of the screen, then size, rotate, or flip them.

The program's user interface is quite unconventional. In addition to the normal menu bar, strips of tool icons cover the top and bottom of the screen, obscuring about a quarter of the drawing area. These icons offer multiple selections in the form of pop-up menus. It's possible to clear them from the screen, but since there are no keyboard equivalents for the functions the icons offer, you will need to restore them frequently. Also unusual is the fact that menus change according to the program context. Rather than ghosting items that are inappropriate, as is customary, the Graphics Studio removes them from the menu bar entirely, replacing them with other choices.

The documentation is adequate, but not outstanding. Information about ►

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changing color palettes and screen resolution, for example, are relegated to a chapter called Advanced Features. The program includes a number of sample pictures, as well as a slide-show program for exhibiting your artwork. The program disk is, alas, copy-protected, using a key-disk scheme.

A Stubborn Streak

Despite its many novel features, the Graphics Studio is lacking in some fundamental areas. First, the program works in one of two fixed resolution modes, 320 × 200 with 32 colors, or 640 × 200 with 16 colors. Considering that there are over 20 distinct display modes available on the Amiga, restricting this program to two seriously impairs its usefulness. For example, because Workbench icons use only two color bitplanes (four colors) and DeluxeVideo (Electronic Arts) uses images with eight colors, you can't use the Graphics Studio to edit pictures for either. Sharing files with other applications is difficult, too. This operation often requires saving a small picture file (a clip or brush); but unlike most paint programs, Graphics Studio will not save images smaller than full-screen size. The title bar doesn't contain any depth-arrangement gadgets either, making it difficult to switch between Graphics Studio and a program that uses a custom screen. In short, while the program works well by itself, it does little to cooperate with others, an important factor to consider when selecting software for your multitasking Amiga.

The program's most serious flaw though, pertains to color cycling, a feature that enables you to do a limited form of animation by changing the colors assigned to the registers. While most paint programs cycle by shifting the color in each register one slot forward or backward, the Graphics Studio lets you cycle whole color palettes. For each step in the cycle, you can specify exactly which color will appear in each register and the amount of time the palette is to remain on screen. A problem arises when the program saves this information in the picture file. Instead of conforming to the IFF standard (maintained by Commodore to ensure that programs may freely exchange data), Graphics Studio's programmers chose to tack the cycling information onto the end of the file's BODY chunk. The proper way to introduce a new IFF feature is to register a chunk type with Commodore, so that other programs will be able to incorporate the new format. Such disregard for the standard makes it doubtful that the Graphics Studio will ever be able to exchange color-cycling information with another application.

Although there is certainly room for low-priced, no-frills software on the market, such programs must meet the basic needs of Amiga users. Translations of programs designed for the Apple IIGS or Atari ST, as the Graphics Studio is, won't do. The Graphics Studio may be considered a powerful low-end paint package on those computers, but because of its limitations, the Amiga version is destined for also-ran status.

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TERRORPODS

THE FIRST THING that strikes you is the gorgeous introductory screen, a re-creation of the box cover. The second thing to strike you is that Terrorpods seems arduous. Because of this, the third thing strikes quickly. It's the "death screen," and it, too, is stunning.

Actually, the game's difficulty is illusory. You can't play Terrorpods simply by looking at the screen; you must read the instructions, which make it seem awfully complicated. This is unfortunate, because it could turn people away from what is a very good game.

Once past the rather steep learning curve, playing Terrorpods is both challenging and fun. The genre is science fiction, and the setting is the remote mining colony Colian. Once a Federation colony, the planet has been taken over by the evil Empire as production center for the monstrous terrorpods—agile war vehicles capable of tremendous destruction, but themselves nearly indestructible.

The Federation has sent you to Colian with a defense strategy vehicle (DSV) and small trading vehicle to learn how terrorpods are made. You do this by collecting completed terrorpod parts.

Colian has ten sub-colonies, each with mining bases, refineries, and manufacturing centers. Your DSV carries various minerals, which you trade with the installations. By trading, you acquire terrorpod components and the minerals you need to survive.

Staying alive isn't easy, though. The Empire knows your mission. They'll fire at you—even send operating terrorpods to destroy their own camps—in order to foil you. First you need fuel; luckily, it's not hard to come by. You also need detonite to blast terrorpods, spoilers, and incoming missiles, zenite to activate your defense shields, and quaza to rebuild installations. Manufacturing centers require aluma, the scarcest mineral, in order to complete their parts.

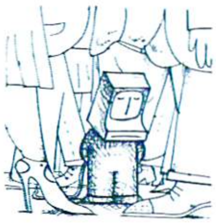
A strategy map helps you plot your moves. Radio transmissions can obtain emergency supplies and protect key centers. Your missile system, while not easy to use, is the only means of destroying a terrorpod for good.

Terrorpods is fascinating, even addictive. Whether you speak English, American, German, French, Danish, Swedish, or Norweigan, the game knows your language. It needs a new manual, perhaps an on-screen tutorial, and a way to save games to disks other than the program disk. The only bug I found is that words are sometimes superimposed on one another and become unreadable, but this is far from fatal. Graphically it's superb and the game play is smooth and enjoyable. I recommend Terrorpods to all action-strategy buffs! *($34.95, Psygnosis Ltd., distributed by Computer Software Services, 2150 Executive Dr., Addison, IL 60101, 800/422-4912. 512K required.*

—Neil Randall ■

THE READERS' CHOICE
B A L L O T   B O X

DECEMBER'S READERS' CHOICE AWARDS may seem a long way off, but we have already started counting ballots here at *AmigaWorld*. If the sheer number of votes is any indication, DeluxePaint II, WordPerfect, Marble Madness, Marauder II, and Earl Weaver Baseball are the top five programs. What counts, though, is the ratings on the ballots, not the number received. Your opinions varied greatly; overall ratings for WordPerfect scored from 2.33 to 10. Here's how the individual races are shaping up:



CREATIVITY (graphics, video, music, desktop publishing)

	Ease of Use	Flexibility	Professional Features	Overall
DeluxePaint II (Electronic Arts)	8.3	8.2	8.3	8.26
Digi-Paint (NewTek)	7.0	8.0	6.7	7.25
Sculpt 3-D (Byte by Byte)	4.6	7.6	7.0	6.40

GAMES

	Playability	Presentation	Longevity	Overall
Faery Tale Adventure (MicroIllusions)	8.6	9.4	8.4	8.80
Fire Power (MicroIllusions)	9.1	8.8	7.8	8.61
Earl Weaver Baseball (Electronic Arts)	8.6	8.1	9.0	8.57

HARDWARE (memory expansion, hard drives, digitizers, genlocks)

	Ease of Installation	Ease of Use	Tech Support	Overall
TimeSaver (C Ltd)	9.0	8.5	8.0	8.50
Digi-View (NewTek)	9.2	8.5	7.0	8.25
Insider (Michigan Soft.)	5.6	9.6	9.3	8.20

HOME (educational, finance)

	Ease of Use	Documentation	Flexibility	Overall
Mavis Beacon Teaches Typing (Electronic Arts)	10	9.0	10	9.67
PHASAR (Finally Soft.)	9.7	9.0	9.5	9.41
Halley Project (Mindscape)	8.0	9.0	7.0	8.00

PRODUCTIVITY (spreadsheets, databases, accounting, telecommunications, word processors)

	Ease of Use	Flexibility	Advanced Features	Overall
Microfiche Filer (Software Visions)	9.7	7.2	4.7	7.25
WordPerfect (WordPerfect)	6.4	6.9	8.0	7.10
Analyze! (Micro-Systems Software)	6.7	5.5	6.5	6.25

PROGRAMMING (languages, utilities)

	Documentation	Flexibility	Advanced Features	Overall
AztecC (Manx)	9.0	8.0	10	9.00
Metacomco Shell (Metacomco)	7.0	10	8.0	8.33
Sam Basic (Parkway Comp. Consult.)	8.0	7.0	9.0	8.00

MISCELLANEOUS (whatever is left)

	Ease of Use	Documentation	Performance	Overall
Marauder II (Discovery)	9.6	8.4	9.3	9.08
CLImate (Prog. Periph. & Soft.)	8.0	5.0	7.0	6.67
Grabbit (Discovery)	8.0	6.0	6.0	6.67

In the comments column, you are all in agreement on several points. Product documentation can stand a good deal of improvement. Abysmal was a popular term. The discrepancy between what software advertisements promise and what the product delivers is too great. In a loud chorus, you also objected to the discrepancy between the promised release dates of products and their actual (much later) release dates. Are you listening, developers?

If you don't agree with the current ratings or opinions, you can voice your views until the polls close September 1, 1988. Mail your votes to The Readers' Choice, *AmigaWorld*, 80 Elm St., Peterborough, NH 03458.

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If you want the complete catalog listings from all four companies—describing each disk in greater detail (listings for nearly 700 PD disks!)—plus order blanks, specials, and information about contributing to AWPDL, send $2.00 for the AWPDL catalog pack (see order form below).

Here are just a few of the disks available from Software Excitement, DevWare, and Chiron Conceptions:

From Software Excitement

(Workbench oriented)

SE #27 - Amoeba Invaders. Arcade game w/enhanced colors and digitized sound. Also other games.

SE #29 - Hack. Fantasy adventure game.

SE #31 - Games2. Eliza (psychiatrist simulation), UFO invasion, Brickout clone, more.

SE #40 - Archive/Unarchive. Compress and uncompress files.

SE #41 - Music Studio Scores2. Collection of Music Studio song files.

SE #44 - Games3. Life, Vegas Slots, Reversi, more.

SE #50 - XLISP. Version of LISP language w/documentation.

SE #51 - PILOT. Version of PILOT language.

SE #93 - Modula-2. Version of Moudula-2 language compiler w/ documentation. Many sample programs.

SE #132 - Videomaker Utilities. Desktop video utilities.

SE #134 - Applications I. Label maker/printer, grocery-list maker, disk cataloger, star viewer (planetarium), more.

SE #135 - Applications II. Fast IFF series player, QuickBase mail-manager d-base, Persmait d-base, more.

From DevWare

(These disks focus on the developer and power user. Most contain source code. All programs must be run from the CLI, and Workbench is not included.)

DW # 5 - MenuDemo C source, PagePrintV1.3 printing program, Proff text-formatting prog. similar to Unix nroff, ProffMacros, C source for screen-dump prog., more.

DW #6 - Text and support prog. for 68010 upgrade, 1.1 addmem prog., IFF display prog., text formatter in C, MicroEmacs1.2, Ogre game, 3 "Boing"-like demos, more.

DW #7 - 2 BBS progs. w/docs., Grep text utility, MenuEd1.2, Tektronics 4010 terminal emulator.

DW #8 - Set of disk-performance tests, font editor, Hack game clues, MandFXP-D2 fast Mandelbrot (shareware), PowerWindows demo, memory speed benchmark test, Shell2.04M (Matt Dillon's command shell that adds aliases, command history, and more to CLI), more.

DW #11 - C. Scheppner assembler examples, assembler-file requester, DirUtil5, DOS help prog.,2 polygon-drawing demos, ray-tracer demo w/C source, more.

DW #16 - LittleSmalltalk object-oriented programming language developed at Xerox w/C source.

DW #25 - Blitter-experimenting prog., doubleclick window to front, printer output redirected to disk utility, fast directory list prog., processes-monitoring prog., pipe-device handler prog., graphics demos, text files, games, more.

From Chiron Conceptions

CC #516 - Sonix Songs #2. Nearly 40 minutes playing time (requires either Sonix 2.0 or Sonix Play program).

CC #516 - Sonix Songs #3. Even more songs (requires Sonix 2.0 or Sonix Play program).

CC #909 - Home Applications. Grocery-list construction set, address book, word processor, text editor, appointment reminder, database, loan-amortization prog.

CC #910 - Science & Education. 2D & 3D math-formula-plotting prog., geometry-demonstration tool, aerodynamics CAD prog., astronomy maps and prediction prog., flash-card study prog., HP-10C calculator emulator, weather predicter.

CC #310 - ARP 1.1. AmigaDOS Replacement Project. Replaces most 1.2 AmigaDOS commands with new, faster, and more powerful commands. Includes docs, C source, executables, and install program.

CC #633 - New Movies. 4 animations for Amiga (requires at least 1MB RAM).

CC #634 - DeluxeVideos #2. 4 animations created with DeluxeVideo (DVideo not required). Note:one of these is PG rated.

CC #635 - Brassart Slideshow #1. Impressionistic French Amiga artist.

CC #636 - Brassart Slideshow #2. More work from Brassart. Note: some PG material.

Remember, most of these are public domain programs, contributed freely to the Amiga community. Some are "shareware" programs for which the authors ask contributions if you feel the program is good enough. There are no guarantees about the quality, usefulness, or results you might get with any particular program. If the disk is faulty, return it for a replacement. Allow two to four weeks for delivery.

If you have programs you would like to contribute to AWPDL, we will do everything possible to see they get into the public domain.

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________, ________, ________, ________, ________

WHAT'S NEW?

A midsummer harvest from the garden of Amiga-related delights.

Compiled by Barbara Gefvert

Down to Business

TWO VOLUMES COMPRISE **Panmead Businessware** for the Amiga. Business Pack 1 includes an Invoicing/Sales Analysis module for streamlining your invoicing and generating specialized and comprehensive sales-analysis reports. This module works in conjunction with the Accounts Receivable System, which lets you maintain customer accounts, make on-screen inquiries into ledger details, and instantly reconcile your ledger. The third of the Pack 1 trio is the Inventory Control System. It provides stock-monitoring tools, and comprehensive reports on stock status, goods on order, and price lists.

The General Ledger and Accounts Payable modules make up Pack 2. The former enables you to chart accounts and budgets, print trading accounts, and more. It also produces financial statements acceptable for banks. With Accounts Payable, you can generate a current position statement at any time, track creditors' invoices to make priority payments, and establish purchase volumes on a period-to-date basis. Each volume is £145. Take care of business with Panmead Limited, 12 Seaforth Ave., New Malden, Surrey, London, UK, 1-942-6512.

Mark of Zorro 2

BEFORE YOU PRODUCE that custom-printed circuit board, shouldn't you test and debug with the **Zorro-2 prototyping board**? With over 4400 plated through holes on a .1-inch grid, the two-sided unit aims for flexibility. The main prototyping area accepts ICs in dual in-line packages, with as many as 64 pins and ICs in arrays of up to 14 × 14. The I/O connector pattern and mounting bracket hold standard D connectors with up to 37 pins. Make your mark for $49.95 at Celestial Systems, 2175 Agate Court, Simi Valley, CA 93065, 805/582-0729.

Pictorial Presentations

PLEAD YOUR CASE with hi-res graphics and animation using **DeluxeProductions**. The presentation program offers a storyboard-design concept, and lets you create 12 scenes per production, with five clips (each containing one animated object) per scene. You can work in overscan, and chain productions together. Pause, forward-, and backward-play functions give you control, while the buffered animation, 4096-color palette, and 40-wipe array provide flexibility. Take the stand for $199.95 at Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, 415/571-7171.

Oubliettes and Ogres

MAD MONSTERS CHASE you. Deadly weapons fire at you. Magical spells hurl lightning bolts that explode in a thunderous crash. Sound like fun? Then get your hands on a copy of the real-time action adventure **Dungeon Master**. The game sells for $39.95; call FTL Games for details: 6160 Lusk Blvd., Suite C-206, San Diego, CA 92121, 619/453-5711.

At Full Throttle

TAKE CONTROL OF the F-16 or the F-18 in **Jet**. The heads-up display lets you monitor your instruments and environment simultaneously, and a missle's-eye view tracks your weapon to point of impact. A complete arsenal, search radar, and target-tracking computer are at your disposal. Practice in free-flight mode and on strike targets, and then dogfight against computer-controlled enemy craft. A multiplayer option pits you against another pilot via serial-port connectors. Jet is $49.95 from subLOGIC Corp., 713 Edgebrook Drive, Champaign, IL 61820, 217/359-8482, 800/637-4983. ►



Blast away at the targets below in subLOGIC's combat flight simulator, Jet.

Disk Dwellings

SO A HERD of unruly disks stampedes your work area daily? Why not round them up? The **VDS120** can corral 120 disks without sacrificing desk space, and the **VDS240** holds twice that! The wall-mountable acrylic units have six and 12 compartments, respectively, and sell for $29.95 and $39.95. Lasso them at Vertical Solutions, PO Box 7535, Olympia, WA 98507.

If it's portable storage you need, the **Disk Tot'em** is your bag. The attache-style case accommodates up to 250 disks; you can remove partitions to carry other items, too. Available for $39.95 from Totem Technologies, PO Box 374, Pinson, AL 35126, 205/856-2437.

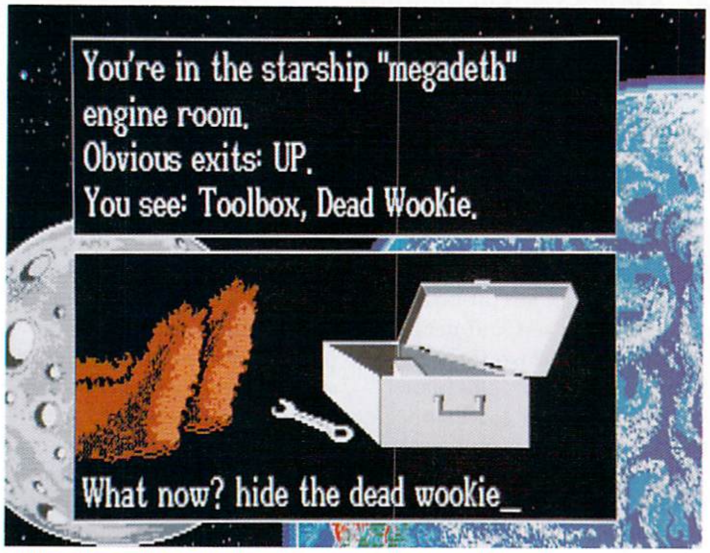
The **Fan File** stands upright like a book, but when it's time to boot up, the unit pops open and fans the ten disks within. The compact plastic file retails for $5.95. A **locking 40-disk acrylic desktop file tray** is available for $16.95. File for either unit with Fellowes Manufacturing, 1789 Norwood Ave., Itasca, IL 60143, 312/893-1600.

Programmed Palatables

IF YOU THINK your Amiga is useless in the kitchen, you're wrong. **Celebrity Cookbook Volume 1** ($34.99) is a home-catering helper containing 50 recipes, wine and bar guides, party tips, a filer that adjusts recipe proportions for one to 999 servings, and more. Still in development, Volume 2 ($19.95) will match the contents of your cupboard and fridge with approriate recipes. Contract your culinary companion from Merrill Ward & Associates, 255 N. El Cielo Road, Suite 222, Palm Springs, CA 92262, 619/328-8728.

Paperback Programmer

WHETHER YOU INTEGRATE the ready-made IFF clipart and clipsounds or use your own, the **Adventure Workshop** gives you the wherewithal to pen—uh, input any interactive story you can dream up. Plunk down $59.95, and you're on your way. Call SunRize Industries for author's guidelines: 3801 Old College Rd., Bryan, TX 77801, 409/846-1311.



Author a hair-raising adventure featuring wookies, or whatever!

It's About Time, Space, and Defense

ROGUE TRAVELER through time and space in search of a priceless treasure, you are the **Time Bandit**. Journey to 16 lands, each with 16 levels, and speak with the characters there. Along the way you get to play high-stakes cards in a dungeon, pilot a starship, and more. Dual-player mode gives you and another player independent screen sections and the ability to interact.

Slaygon puts you at the helm of the world's most sophisticated military robot. Your mission is to disable the evil do-badders' computer, which seeks to annihilate human life through germ warfare. Slaygon's controls include energy level and directional indicators, a message display, a map view of your movements, and a 3-D front view. Each adventure is $39.95. Contact Microdeal, 576 S. Telegraph, Pontiac, MI 48053, 313/334-8729.

The Latest Title

VIDEOTITLER OWNERS: welcome Version 1.1 of the graphics and titling package. Aegis says they have eradicated all known bugs, and added an eight-page manual supplement. New features include a sleep mode that allows multitasking between VideoTitler and VideoSEG, plus 3-D perspective paste, sub-menu markers, and pop-up menus on the main disk. The VideoSEG disk now offers 27 additional transistions, a frame-specs requester, scrolling ANIM files, and support for the SuperGen (Digital Creations) genlock. The program is $149.95; registered owners can update at no charge. Get VideoTitler 1.1 from Aegis, 2115 Pico Blvd., Santa Monica, CA 90405, 213/392-9972, 800/345-9871.

Hear Ye

EDITING AND sending patches takes just a point and a click with the **CZ-Pat** editor/librarian for your Casio 101/1000. You can edit in increment/decrement fashion with the mouse or by selecting numbers from a table. You can also group patches into blocks to send, and print them out, too. The euphonic editor is $35 from CRB Productions, 15 Norton St., Nashua, NH 03060.

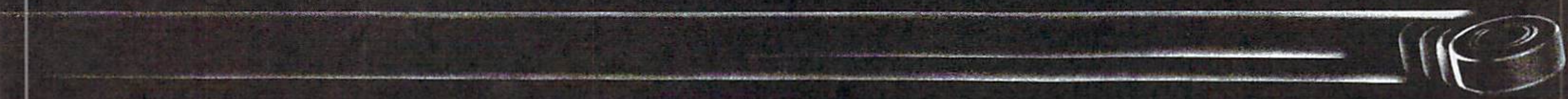
Four on the Floor

IT'S A NICE, sunny day. Why not pop into a long, sleek machine, power up, and drive away? While the **Master-3A** might be a bit cramped for you, your floppies will find it comfy. The external disk drive allows throughput for linking up to four drives, and sports a 25-inch input cable. Take one out of the showroom for $189 at Surfside Components, PO Box 1836, Capitola, CA 95010, 408/462-9494.

Who Do Voodoo?

BACK IN AQUATANIA, the green witches have stolen the magic bracelet that protects the city, and dispersed the charms. **Jinxter** is an illustrated text adventure, complete with a newspaper and play guide scattered with clues. Your job is to locate and capture the seven charms before the witches gain absolute power. The luck of the guardians is yours for $39.95. Rainbird Software of London is distributed by Activision, 2350 Bayshore Pkwy., Mountain View, CA 94043, 415/960-0518. ►

SLAP SHOT!™ is coming.



The next generation in sports simulations will be available this summer.

From the creators of GRIDIRON!®, the award-winning football simulation.

BETHESDA SOFTWORKS, P.O. Box 1665, Bethesda, Md. 20817 (301) 469-7061 Orders only: 1 800-432-1988

Renewed Quest

THE GREAT WIZARD Mesron has transported you to the distant past—to a time before the mad sorcerers created the evil book of magic. Your mission? Find and stop them. The adventure you thought ended with Questron takes on a new twist in **Questron II**. With improved 3-D graphics, the fantasy promises to surpass its predecessor. It's $49.95 from Strategic Simulations Inc., 1046 N. Rengstorff Ave., Mountain View, CA 94043, 415/964-1353.

Yes, Yes, Internet

NOW YOU CAN network your A2000 into existing computing resources to act as a front end for more powerful machines. Compatible with the internal expansion system, the **Amiga Internet** package includes an A2000 Ethernet controller with a 10-meg transfer rate, plus both thick and thin cable interfaces for $899. Internet supports the industry-standard network-file system, allowing transparent sharing of file systems with over 100 computer vendors, and full TCP/IP with FTP and TELNET applications for remote file exchange and terminal emulation. Contact Ameristar Technologies for more information: 47 Whittier Ave., Medford, NY 11763, 516/698-0834.

Hands Off!

ONE-TOUCH DIGITIZING is now possible with **Digi-Droid**, the automated filter wheel, connected to your NewTek Digi-View system. Advance your order with $79.95 to NewTek, 115 W. Crane St., Topeka, KS 66603, 913/354-1146.

Have a Cigar

SPECIAL DELIVERY FROM the Discovery Software stork comes **Zoom!**, sibling of the game Arkanoid. Zoom! promises chase-maze fun on 50 levels. Send $29.95 to Discovery at 163 Conduit Street, Annapolis, MD 301/268-9877.



Zoom through the grid and grab the goodies, but don't get gobbled.

Gone Gaming

DIGITEK HAS A few suggestions for your summer entertainment. You'll need quick reflexes to shoot through the 40 levels of the Break Out-style **Amegas** game. . . .Armed with mirrors, a magic light, and garlic, you must make it through the **Vampire's Empire** to battle the evil Dracula. . . .**Thunder Boy** takes you across the land of the dragon in search of a damsel in distress. . . .**Gunshoot** lets you duel with another person via the two-player mode, or any of 12 computer opponents. . . .If you think you can succeed where all else have failed, try the labyrinth of **Final Mission**, scattered with mines, traps, and energy fields. . . .In **The BIG Deal**, your job is to maneuver Floyd the Droid through a restaurant kitchen, serving up the patrons' requests. . . .If all you want to do is get high, you can take to the not-so-friendly skies in the combat simulator **Skyblaster**, for one or two players. Vampire's Empire is $44.95, all others are $34.95 from DigiTek, 10415 N. Florida Ave., Suite 410, Tampa, FL 33612, 813/933-8023.

Across the Fruited Plains

CAN'T SQUEEZE A cross-country trip into your schedule this summer? Then get away with the **Great States II** game. Your computer-chair excursion will take you across the fab 50, teaching you the geographic features, topography, population densities, and assorted trivia via speech, digitized sound, graphics, and animation. When was the last time you travelled the US for $39.95? Great States USA (The Other Guys) owners can upgrade for $10. Designing Minds is located at 3006 N. Main, Logan, Utah 84321. Phone: 801/752-2500.

Swipe the Sword

A PROUD NINJA warrior, you must recover the magical sword stolen from your sect before you can claim the title of Master Ninja. The sword is hidden in the castle of the evil Japanese warlord, Sanjo. As you work your way through the castle's many chambers, you'll encounter Samurai guards, evil mystic priests, and deadly tigers. **Master Ninja: Shadow Warrior of Death** ($39.95) promises realistic graphics and sound, and over 25 combat scenes that become more difficult as you progress. Start your quest by calling Paragon Software's distributor, Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171.

On Your Mark

YOU START OUT in a Mercedes 560 SEC. Beat the clock on six different race tracks, and you graduate to a Porsche 911 Turbo. More success wins you the driver's seat in a Lamborghini Countach, but only the most skilled can take the wheel of the Ferrari GTO. **Crazy Cars** lets you hammer down to speeds of 189 mph for only $39.95. To get your copy, race to Titus Software Corp., 20432 Corsico St., Chatsworth, CA 91311, 818/709-3692.

Frustration Buster

ARE YOU BILKED, baffled or buffaloed? Need a hint to get you back on track? **Quest for Clues** provides solutions—written in code so as not to spoil your fun—for 50 role-playing and adventure games. The $24.99 book might just save your sanity. Cue in at Origin Systems Inc., 136 Harvey Road, Bldg. B, Londonderry, NH 03053, 603/644-3360. ■

HELP KEY

As the summer broils along, Cool Hand Lou is on the question hot seat.

By Louis R. Wallace

Mulling Over Memory

Q: *I have an Amiga 1000 with 512K and am considering upgrading the memory by at least 2MB. Will all software work when I add the extra memory? If not, why? What does auto-configuring mean? Will the extra memory increase the speed of program execution?*

J. LeBel
Quebec, Canada

A: An Amiga with only 512K is, at best, a minimal machine, limping along at only a fraction of its abilities. If you want to use the latest powerhouse software, you need the extra memory. If you want the ease and performance a RAM disk offers, you need the extra RAM. Your concerns are quite justified, however. Some software (mostly games released before Workbench 1.2) will not work with over 512K of memory. Many of the programs have been reworked to function with extra RAM, and you can usually get an upgraded version direct from the manufacturer. If an upgrade is not available, you can still use most software by running NOFASTRAM first. Even with all these remedies, some of your programs may not work with the extra RAM installed.

When you turn your Amiga on, auto-config hardware automatically tells the operating system what it is, what it needs in terms of system resources, and what it will do for the computer and its users. This makes it easy for the you to install and use peripherals. Just plug your auto-config memory board into the expansion bus and turn on the computer. The memory board transmits all the details.

Under some situations, external RAM (also called Fast RAM) will allow your programs to run somewhat faster. Unlike a program in chip memory, if a program is in Fast RAM, there is no bus contention, or forced waiting while the custom chips access the lower 512K of Chip RAM. To facilitate the use of fast memory when your Amiga has more than 512K, add the statement SYS:SYSTEM/FASTRAMFIRST to your startup-sequence.

Slow Bridge

Q: *In your Bridgeboard article (see "Bridge Over Troubled Waters," p. 20, in the February '88 issue of* AmigaWorld*), you mentioned the PC side worked okay with an EGA (Enchanced Graphics Adaptor) board and separate EGA monitor. You also said that the screen display is slow when using the PC side with an Amiga monitor. Is it still slow when using the EGA with a second monitor, or is it normal for a PC with an EGA board?*

S. Laminack
Fairfield, CA

A: The screen updates slowly when you use the Amiga display for the PC side of the Bridgeboard, but if you are using a second monitor with an EGA card, the output to the EGA monitor screen updates at standard PC speed. Any text output generated is being sent to the Amiga PC window, however, as well as the EGA monitor. The Amiga's PC window display is still slow, but it does not effect the EGA output. If it is annoying, resize the PC window to a small area and place it out of sight.

Trouble from The Start

Q: *I am having problems running programs from within my startup-sequence file. I want them to run, then I want to close the CLI with an ENDCLI command. If I precede the ENDCLI with the programs' names, the first program runs and control never returns to the startup-sequence file. The others never get started, and the CLI never closes. If I put them after the ENDCLI, the CLI closes but the programs don't run! How do I multitask them and get rid of the CLI?*

B. Stadfeld
Manitoba, Canada

A: Without knowing what programs you are running, I can only guess at the problem. If the program names are not preceded by the AmigaDOS RUN command in your startup-sequence file, the first program in the list will start, and unless it returns to the CLI, execution of your startup-sequence file will stop. Try adding the RUN command before each program's name, for example RUN ED. The programs should each become separate tasks, and the startup-sequence batch should continue, all the way to the ENDCLI. Remember, some programs require the CLI they started from to remain open, so you might not be able to close the window and still use the program.

Mac Emulator Rumor

Q: *I have long heard rumors of a Macintosh emulation for the Amiga, but nothing has ever come to light. Is there any truth to the talk?*

J. Walis
Milwaukee, WI

A: The Mac Emulator rumor is based on an Atari ST product called The Magic Sac. This hardware/software package from Data Pacific Inc. allows ST owners to run some Macintosh software. Data Pacific told me they are working on an Amiga version, but would not commit themselves to a release deadline. They understand that there is a strong demand for the product, and are compiling a mailing list of interested parties to be notified when, and if, there is news. Send your name and address to Data Pacific Inc., 609 E. Speer Blvd., Denver, CO 80203, 303/733-8158. ■

from p. 52

```
Blk=30:Wht=31:fgPen=Red:olPen=fgPen:HFact=5:VFact=5
SFact=4:SmItem=6:BlkX=19:BlkY=19:OldX=23:OldY=23
BTCur=0:frame=-1:HStripe=0:VStripe=0:Bold=0:Under=0
TOpen=0:TBold=0:TUnder=0:Pen=0:StPix=0:x=0:x1=0:x2=0
y=0:y1=0:y2=0:m=0:n=0:mID=0:mItem=0:TxtLen=0:Xmin=0
Xmax=0:Ymin=0:Ymax=0:UseX=0:UseY=0:Bx=0:By=0
Row=0:Col=0:continue=0:Style%=0
Text$="":key$="":Type$="":Title$=""
DIM Colors(NumCols-1,2),CurBG(2),CurGrd(2)
DIM UndoBuf%(20010)
FOR x=0 TO NumCols-1
  FOR y=0 TO 2:READ Colors(x,y):NEXT
NEXT
DATA 0.75,0.75,0.75, 0.00,0.00,1.00, 0.00,0.00,1.00
DATA 1.00,0.50,0.50, 1.00,0.00,0.00, 0.70,0.00,0.00
DATA 1.00,0.75,0.50, 1.00,0.50,0.00, 1.00,0.25,0.00
DATA 1.00,1.00,0.70, 1.00,1.00,0.00, 1.00,0.60,0.00
DATA 0.50,1.00,0.50, 0.00,1.00,0.00, 0.00,0.50,0.00
DATA 0.00,1.00,1.00, 0.00,0.00,1.00, 0.00,0.00,0.60
DATA 0.70,0.60,1.00, 0.70,0.00,1.00, 0.70,0.00,0.60
DATA 1.00,0.50,1.00, 1.00,0.00,1.00, 0.50,0.00,0.50
DATA 0.60,0.30,0.00, 0.40,0.10,0.00, 0.30,0.00,0.00
DATA 0.75,0.75,0.75, 0.50,0.50,0.50, 0.25,0.25,0.25
DATA 0.00,0.00,0.00, 1.00,1.00,1.00
CurBG(r)=Colors(0,r):CurBG(g)=Colors(0,g)
CurBG(b)=Colors(0,b):CurGrd(r)=Colors(2,r)
CurGrd(g)=Colors(2,g):CurGrd(b)=Colors(2,b)
SCREEN 2,320,200,5,1:WINDOW 2,,,16,2
FOR x=0 TO NumCols-1
  PALETTE x,Colors(x,r),Colors(x,g),Colors(x,b)
NEXT
COLOR grid,bg:CLS
LOCATE 10,12:PRINT"Basic Video Text"
LOCATE 12,19:PRINT"by"
LOCATE 14,1:PRINT PTAB(91);"Bryan D. Catley"
CHDIR":BasicDemos":LIBRARY"graphics.library"
CHDIR":":Msg " "
MENU 1, 0,1,"BigText"
MENU 1, 1,1,"Open          ":MENU 1, 2,0,"Clear It    "
MENU 1, 3,0,"Draw It       ":MENU 1, 4,0,"Erase It    "
MENU 1, 5,0,"Place It      ":MENU 1, 6,0,"Undo It     "
MENU 1, 7,1,"Grid OFF      ":MENU 1, 8,1,"H Stripe ON "
MENU 1, 9,1,"V Stripe ON ":MENU 1,10,1,"Draw Factors"
MENU 1,11,1,"Quit          "
MENU 2,0,1,"Pens"
MENU 2,1,1,"BG Color  ":MENU 2,2,1,"Grid Color"
MENU 2,3,1,"FG Pen    ":MENU 2,4,1,"OL Pen    "
MENU 3,0,0,"Style"
MENU 3,1,2,"  Plain        ":MENU 3,2,1,"Underline ON "
MENU 3,3,1,"Bold ON        ":MENU 3,4,1,"  Italics    "
MENU 4,0,1,"Scroll"
MENU 4,1,1,"Left ":MENU 4,2,1,"Right"
MENU 4,3,1,"Up   ":MENU 4,4,1,"Down "
MENU 4,5,1,"  X 2":MENU 4,6,2,"  X 4"
MENU 4,7,1,"  X 8"
GET(0,0)-(ScWid,ScDep),UndoBuf%
CLS:GOSUB DoGrid:ON MENU GOSUB GetMenu:MENU ON
WaitHere:  ' Wait for a Menu Selection
mID=0:mItem=0:WHILE mID=0:SLEEP:WEND
ON continue GOTO WaitHere,GetText,DrawTxt,DoFactors
ON continue-4 GOTO PgmExit

GetText:  ' Get Users Input Text
IF TOpen THEN DoClose ELSE DoOpen
DoClose:
IF StPix=0 THEN StPix=8:GOTO NextChar
WINDOW CLOSE 3:TOpen=0
LINE(BlkX-2,BlkY-2)-(BlkX,BlkY),bg,bf
```

Listing continued on p. 88

from p. 87

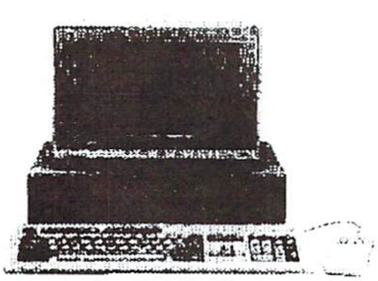
```
MENU 1,1,1,"Open        ":MENU 1,2,0:MENU 1,3,0
MENU 1,5,0:MENU 1,11,1:MENU 3,0,0
Text$="":TxtLen=0:BTCur=0:GOTO WaitHere
DoOpen:
WINDOW 3,"Enter Text:",(62,135)-(248,171),18,2
COLOR ,Blk:CLS:LINE(5,5)-STEP(176,12),Wht,bf
CALL SetSoftStyle(WINDOW(8),Style%,255)
MENU 1,1,0,"Close       "
MENU 1,5,0:MENU 1,10,0:MENU 1,11,0:MENU 3,0,1
TOpen=-1:StPix=8:Text$="":COLOR ,Wht
NextChar:
TxtLen=TextLength&(WINDOW(8),SADD(Text$),LEN(Text$))
LOCATE 2:COLOR Org:PRINT PTAB(StPix+TxtLen+2);"|":
COLOR Blk:key$="":WHILE key$="":key$=INKEY$:WEND
IF WINDOW(1)<>3 THEN WINDOW OUTPUT 3
IF key$=CHR$(13) THEN GetDone
IF key$=CHR$(8) OR key$=CHR$(31) THEN CurLeft
IF key$<CHR$(32) OR key$>CHR$(127) THEN
  BEEP:GOTO NextChar
END IF
IF StPix+TxtLen>160 THEN BEEP:GOTO NextChar
Text$=Text$+key$
PRINT PTAB(StPix);:Msg Text$:GOTO NextChar
CurLeft:
IF TxtLen=0 THEN BEEP:GOTO NextChar
Text$=LEFT$(Text$,LEN(Text$)-1)
PRINT PTAB(StPix);:Msg Text$+"  ":GOTO NextChar
GetDone:
COLOR Wht,Wht:PRINT PTAB(StPix+TxtLen+2);" ";
WINDOW OUTPUT 2
MENU 1,1,1:MENU 1,2,1:MENU 1,3,1
MENU 1,5,1:MENU 1,10,1
IF LEN(Text$)>0 THEN
  LINE(BlkX-2,BlkY-2)-(BlkX,BlkY),fgPen,bf
  LINE(BlkX-2,BlkY-2)-(BlkX,BlkY-2),olPen
END IF
BTCur=-1:GOTO WaitHere

DrawTxt:  ' Draw Enlarged Text
IF WINDOW(1)<>3 THEN WINDOW OUTPUT 3
IF BlkX+((StPix+TxtLen-8)*HFact)>ScWid THEN
  BEEP:COLOR Red,Blk:LOCATE 4,2:Msg "Text too long!"
  GOTO WaitHere
ELSEIF BlkY+(8*VFact)>ScDep THEN
  BEEP:COLOR Red,Blk:LOCATE 4,2:Msg "Text too tall!"
  GOTO WaitHere
ELSE
  MENU 1,6,1
  COLOR Blk,Blk:LOCATE 4,2:PRINT SPACE$(20);
END IF
WINDOW 2:GET(0,0)-(ScWid,ScDep),UndoBuf%:WINDOW 3
Xmin=8:Xmax=StPix+TxtLen+Xmin
Ymin=8:Ymax=17:Bx=BlkX:By=BlkY
x1=HFact-1+VStripe:y1=VFact-1+HStripe
FOR x=Xmin TO Xmax
  FOR y=Ymin TO Ymax
    IF POINT(x,y)=Blk THEN
      WINDOW OUTPUT 2
      LINE(Bx,By)-STEP(x1,y1),fgPen,bf
      IF olPen<>fgPen THEN
        WINDOW OUTPUT 3:IF POINT(x-1,y)<>Blk THEN
          WINDOW OUTPUT 2
          LINE(Bx,By)-STEP(0,y1),olPen
        END IF
        WINDOW OUTPUT 3:IF POINT(x+1,y)<>Blk THEN
          WINDOW OUTPUT 2
          LINE(Bx+x1,By)-STEP(0,y1),olPen
        END IF
        WINDOW OUTPUT 3:IF POINT(x,y-1)<>Blk THEN
          WINDOW OUTPUT 2
          LINE(Bx,By)-STEP(x1,0),olPen
        END IF
        WINDOW OUTPUT 3:IF POINT(x,y+1)<>Blk THEN
          WINDOW OUTPUT 2
          LINE(Bx,By+y1)-STEP(x1,0),olPen
        END IF
```

Listing continued on p. 90

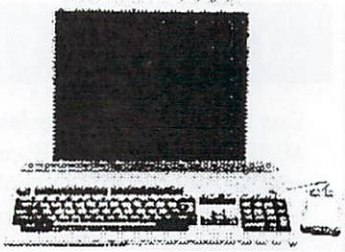
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- MINISCRIBE 20 MD INT 3.5 DR — 275
- XEBEC 20 MB EXT DRIVE — 799
- AMIGA 501 512K MEMORY — 150
- AMIGA BRIDGE BOARD W 5.25 D — 525
- AMIGA 1300 GENLOCK — 205
- INSIDER BOARD — CALL
- STARBOARD II 2MB — CALL
- STARBOARD II 1MB — CALL
- EPSON EX800 W COLOR — CALL
- EPSON FX86E — CALL
- EPSON FX 286E — CALL
- EPSON LQ2500 — CALL
- OKIMATE 20 W INTERFACE — 219
- OKI ML 182 PLUS — 247
- OKI ML 192 PLUS — 357
- OKI ML 193 PLUS — 472
- OKI ML 292 PLUS — 615
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from p. 88

```
      END IF
      WINDOW OUTPUT 3
    END IF
    By=By+VFact
  NEXT
  Bx=Bx+HFact:By=BlkY
NEXT
MENU 1,4,1:GOTO WaitHere

DoFactors:  ' Set Horizontal & Vertical Factors
MENU 1,0,0:MENU 2,0,0:MENU 3,0,0:MENU 4,0,0
WINDOW 5,,(63,8)-(247,168),0,2
COLOR Yel,DBrw:CLS
LOCATE  2,3:PRINT"Horizontal Factor:"
LOCATE  4,3:PRINT" x1  x2  x3  x4  x5"
LOCATE  6,3:PRINT" x6  x7  x8  x9 x10"
LOCATE  8,3:PRINT"Vertical Factor:"
LOCATE 10,3:PRINT" x1  x2  x3  x4  x5"
LOCATE 12,3:PRINT" x6  x7  x8  x9 x10"
LOCATE 14,3:PRINT"x11 x12 x13 x14 x15"
LOCATE 16,3:PRINT"x16 x17 x18 x19 x20"
LOCATE 19,11:PRINT"OK"
LINE(12,20)-STEP(160,32),Yel,b
LINE(12,36)-STEP(160,0),Yel
FOR x=44 TO 140 STEP 32
  LINE(x,20)-STEP(0,32),Yel
NEXT
LINE(12,68)-STEP(160,64),Yel,b
FOR y=84 TO 116 STEP 16
  LINE(12,y)-STEP(160,0),Yel
NEXT
FOR x=44 TO 140 STEP 32
  LINE(x,68)-STEP(0,64),Yel
NEXT
LINE(12,140)-STEP(160,16),Yel,b
n=HFact:m=20:GOSUB SetFact1
n=VFact:m=68:GOSUB SetFact1
GetFact:
WHILE MOUSE(0)<>0:WEND:WHILE MOUSE(0)=0:WEND
x=MOUSE(1):y=MOUSE(2)
IF x<12 OR x>172 THEN GetFact
IF y>20 AND y<52 THEN GetHor
IF y>68 AND y<132 THEN GetVrt
IF y<140 OR y>166 THEN GetFact ELSE FactXit
GetHor:
n=HFact:m=20:GOSUB SetFact
HFact=n:GOTO GetFact
GetVrt:
n=VFact:m=68:GOSUB SetFact
VFact=n:GOTO GetFact
SetFact:
Row=INT((n-1)/5):Col=(n-1) MOD 5
LINE(13+Col*32,m+1+Row*16)-STEP(30,14),DBrw,b
Col=INT((x-12)/32)+1:Row=INT((y-m)/16)
n=Col+(Row*5)
SetFact1:
Row=INT((n-1)/5):Col=(n-1) MOD 5
LINE(13+Col*32,m+1+Row*16)-STEP(30,14),Red,b
RETURN
FactXit:
WINDOW CLOSE 5
MENU 1,0,1:MENU 2,0,1:MENU 3,0,1:MENU 4,0,1
GOTO WaitHere

PgmExit:  ' Quit and Return to Basic
IF Style%<>0 THEN CALL SetSoftStyle(WINDOW(8),0,255)
MENU OFF:MENU RESET:LIBRARY CLOSE
WINDOW CLOSE 2:SCREEN CLOSE 2
CLEAR ,25000:END

GetMenu:  ' Come Here on any Menu Selection
continue=1:mID=MENU(0):mItem=MENU(1)
ON mID GOTO DoBigText,DoPens,DoStyle,DoScroll

DoBigText:  ' Handle Big Text Requests
ON mItem GOTO TOpnCls,TClr,TDrw,TErs,TPlc,TUndo
ON mItem-6 GOTO TGrid,THor,TVrt,TFact,TQuit
TOpnCls:
```

```
continue=2:GOTO MenuExit
TClr:
WINDOW OUTPUT 2
LINE(BlkX-2,BlkY-2)-(BlkX,BlkY),bg,bf:BTCur=0
WINDOW OUTPUT 3
COLOR ,Blk:CLS:LINE(5,5)-STEP(176,12),Wht,bf
COLOR Blk,Wht
MENU 1,1,0:MENU 1,2,0:MENU 1,3,0
MENU 1,5,0:MENU 1,10,0
Text$="":StPix=0:continue=2:GOTO MenuExit
TDrw:continue=3:GOTO MenuExit
TErs:
IF WINDOW(1)<>2 THEN WINDOW OUTPUT 2
GET(0,0)-(ScWid,ScDep),UndoBuf%
MENU 1,4,0:CLS:GOSUB DoGrid
IF TOpen THEN
  LINE(BlkX-2,BlkY-2)-(BlkX,BlkY),fgPen,bf
  LINE(BlkX-2,BlkY-2)-(BlkX,BlkY-2),olPen
END IF
GOTO MenuExit
TGrid:
IF frame THEN
  PALETTE grid,CurBG(r),CurBG(g),CurBG(b)
  MENU 1,7,1,"Grid ON     ":frame=0:GOTO MenuExit
ELSE
  PALETTE grid,CurGrd(r),CurGrd(g),CurGrd(b)
  MENU 1,7,1,"Grid OFF    ":frame=-1:GOTO MenuExit
END IF
TPlc:
WINDOW 2:WHILE MOUSE(0)<>0:WEND:WHILE MOUSE(0)=0:WEND
OldX=BlkX:OldY=BlkY:BlkX=MOUSE(1):BlkY=MOUSE(2)
LINE(OldX-2,OldY-2)-(OldX,OldY),bg,bf
LINE(BlkX-2,BlkY-2)-(BlkX,BlkY),fgPen,bf
LINE(BlkX-2,BlkY-2)-(BlkX,BlkY-2),olPen
WHILE MOUSE(0)<>0:WEND:WINDOW 3
GOTO MenuExit
THor:
IF HStripe THEN
  MENU 1,8,1,"H Stripe ON ":HStripe=0:GOTO MenuExit
END IF
MENU 1,8,1,"H Stripe OFF":HStripe=-1:GOTO MenuExit
TVrt:
IF VStripe THEN
  MENU 1,9,1,"V Stripe ON ":VStripe=0:GOTO MenuExit
END IF
MENU 1,9,1,"V Stripe OFF":VStripe=-1:GOTO MenuExit
TFact:
continue=4:GOTO MenuExit
TUndo:
IF TOpen THEN WINDOW 2
PUT(0,0),UndoBuf%,PSET
IF TOpen THEN WINDOW 3
GOTO MenuExit
TQuit: continue=5:GOTO MenuExit

DoStyle:  ' Handle Request for Text Display Change
ON mItem GOTO SetPlain,DoUnder,DoBold,SetItalics
SetPlain:
Style%=Style% AND 3
MENU 3,1,2:MENU 3,4,1:GOTO SetStyle
DoUnder:
IF TUnder THEN
  Style%=Style% AND 6
  TUnder=0:MENU 3,2,1,"Underline ON ":GOTO SetStyle
ELSE
  Style%=Style% OR 1
  TUnder=-1:MENU 3,2,1,"Underline OFF":GOTO SetStyle
END IF
DoBold:
IF TBold THEN
  Style%=Style% AND 5
  TBold=0:MENU 3,3,1,"Bold ON      ":GOTO SetStyle
ELSE
  Style%=Style% OR 2
  TBold=-1:MENU 3,3,1,"Bold OFF     ":GOTO SetStyle
END IF
SetItalics:
Style%=Style% OR 4
```

Listing continued on p. 92

from p. 91

```
MENU 3,1,1:MENU 3,4,2:GOTO SetStyle
SetStyle:
WINDOW OUTPUT 3
CALL SetSoftStyle(WINDOW(8),Style%,255)
Text$="":StPix=StPix+TxtLen:TxtLen=0:GOTO MenuExit

DoPens:  ' Handle Change of Pens and/or Palettes
ON mItem GOTO ChngBG,ChngGrid,ChngFGPen,ChngOLPen
ChngBG:
Type$="BG":GOSUB GetPen
CurBG(r)=Colors(Pen,r)
CurBG(g)=Colors(Pen,g)
CurBG(b)=Colors(Pen,b)
IF NOT frame THEN
  PALETTE grid,CurBG(r),CurBG(g),CurBG(b)
END IF
PALETTE bg,CurBG(r),CurBG(g),CurBG(b):GOTO MenuExit
ChngGrid:
Type$="Grid":GOSUB GetPen
CurGrd(r)=Colors(Pen,r)
CurGrd(g)=Colors(Pen,g)
CurGrd(b)=Colors(Pen,b)
PALETTE 1,CurGrd(r),CurGrd(g),CurGrd(b)
IF frame THEN
  PALETTE grid,CurGrd(r),CurGrd(g),CurGrd(b)
END IF
GOTO MenuExit
ChngFGPen:
Type$="Drawing":GOSUB GetPen
IF fgPen=olPen THEN olPen=Pen
fgPen=Pen:GOTO SetBTcur
ChngOLPen:
Type$="Outline":GOSUB GetPen:olPen=Pen
SetBTcur:
IF BTCur THEN
  WINDOW OUTPUT 2
  LINE(BlkX-2,BlkY-2)-(BlkX,BlkY),fgPen,bf
  LINE(BlkX-2,BlkY-2)-(BlkX,BlkY-2),olPen
END IF
GOTO MenuExit

DoScroll:  ' Handle Scroll Request
x1=0:x2=ScWid:y1=0:y2=ScDep
ON mItem GOTO ScLeft,ScRight,ScUp,ScDown
ON mItem-4 GOTO SetSFact,SetSFact,SetSFact
SetSFact:
MENU 4,SmItem,1:SFact=2^(mItem-4)
SmItem=mItem:MENU 4,SmItem,2
GOTO MenuExit
ScLeft:   x1=SFact:x=SFact*-1:y=0:GOTO ScrollIt
ScRight:  x2=ScWid-SFact:x=SFact:y=0:GOTO ScrollIt
ScUp:     y1=SFact:x=0:y=SFact*-1:GOTO ScrollIt
ScDown:   y2=ScDep-SFact:x=0:y=SFact:GOTO ScrollIt
ScrollIt: SCROLL(x1,y1)-(x2,y2),x,y:GOTO MenuExit

MenuExit:  ' Leave Menu Event & Return to Caller
RETURN

DoGrid:  ' Draw Grid Over Background
PALETTE grid,CurBG(r),CurBG(g),CurBG(b)
FOR x=16 TO 320 STEP 16:LINE (x,0)-(x,200),grid:NEXT
FOR x=16 TO 192 STEP 16:LINE (0,x)-(320,x),grid:NEXT
IF frame THEN
  PALETTE grid,CurGrd(r),CurGrd(g),CurGrd(b):END IF
RETURN

GetPen:  ' Draw Palettes on Screen & Get Selection
Title$="Select "+Type$+":":x=0
WINDOW 4,Title$,(0,0)-(290,12),0,2
FOR y=3 TO NumCols-1
  LINE(x,1)-STEP(10,10),y,bf:x=x+10
NEXT
WHILE MOUSE(0)<>0:WEND:WHILE MOUSE(0)=0:WEND
Pen=INT((MOUSE(1)/10)+3)
WHILE MOUSE(0)<>0:WEND:WINDOW CLOSE 4:RETURN

SUB Msg (MsgTxt$) STATIC
CALL Text&(WINDOW(8),SADD(MsgTxt$),LEN(MsgTxt$))
END SUB ■
```

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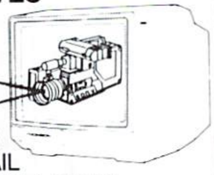
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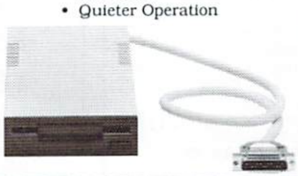
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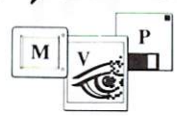
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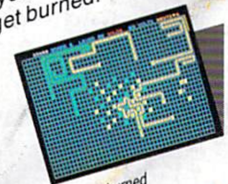
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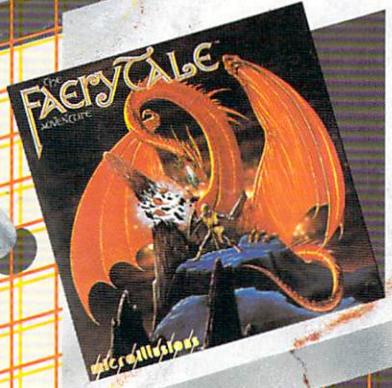


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